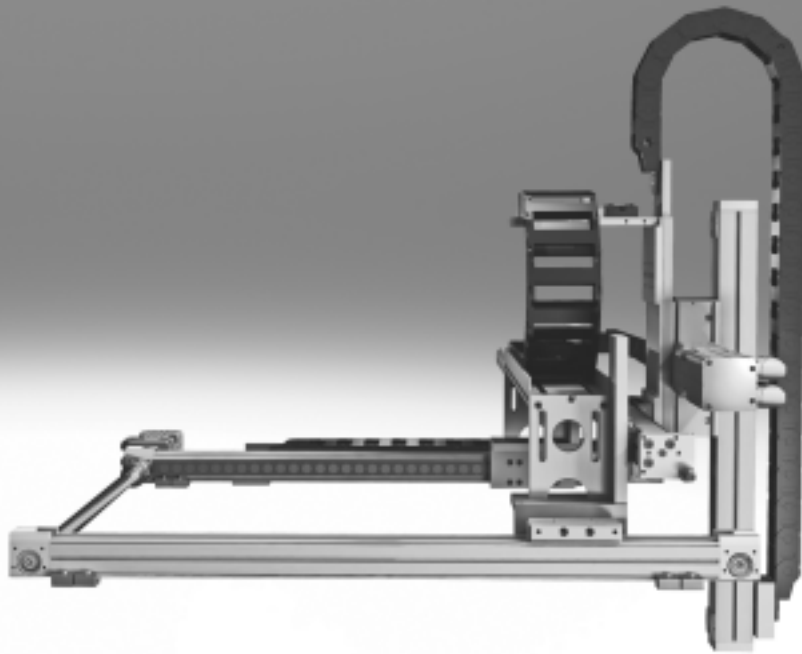


## Toothed belt axes DGE

**FESTO**



# Toothed belt axes DGE

Key features

FESTO

## At a glance

- Precision, rigid guide
- Highly adaptable, thanks to wide choice of mounting and attachment options
- Wide range of options for attaching drive units
- Comprehensive range of mounting accessories for multi-axis combinations
- Optimally adapted motor controller combinations

## Basic version DGE-ZR

- Stroke lengths from 1 ... 4500 mm
- Without guide
- Low characteristic load values



## With recirculating ball bearing guide DGE-ZR-KF

- Stroke lengths from 1 ... 4500 mm
- Standard slide or extended slide
- Medium to high characteristic load values



## With protected version DGE-ZR-KF-GA

- Stroke lengths from 1 ... 1800 mm
- Standard slide
- Guide and slide are fitted with a cover to protect against the ingress of particles from above and the side



## With roller guide DGE-ZR-RF

- Stroke lengths from 1 ... 5000 mm
- Standard slide or extended slide
- Internal, protected roller guide
- Medium characteristic load values
- High speeds possible



# Toothed belt axes DGE

Key features

## System selection for electromechanical drives

Toothed belt axis



Note

For the toothed-belt axes and the motors there are matching complete solutions.

## Motor kit

Axial kit

→ 58



Axial kit consisting of:

- Motor flange
- Coupling housing
- Coupling
- Screws

## Motor

→ 58



1 Servo motor EMME-AS, EMMS-AS

2 Stepper motor EMMS-ST

## Motor controller

Technical data → Internet: motor controller



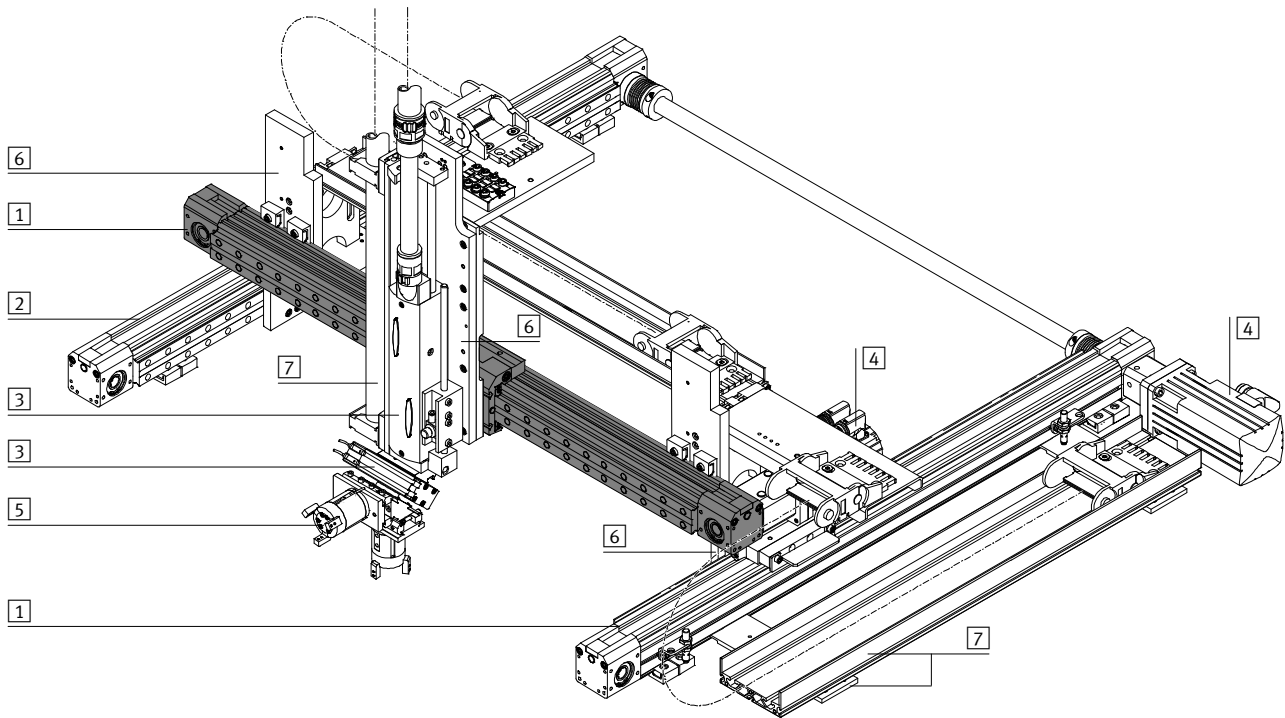
1 Servo motor controller CMMP-AS

2 Stepper motor controller  
CMMS-ST

# Toothed belt axes DGE

System example

## System product for handling and assembly technology



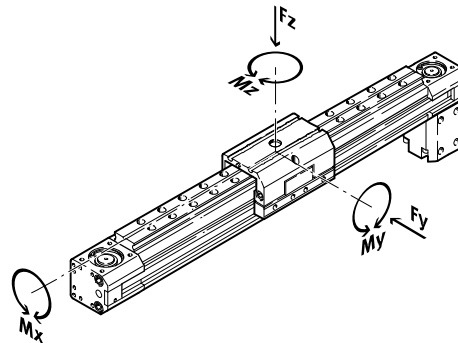
System components and accessories		
Type	Description	→ Page/Internet
1	Axes	Wide range of combination options within handling and assembly technology axes
2	Passive guide axes	Diverse possible combinations in handling and assembly technology guide axes
3	Drives	Wide range of combination options within handling and assembly technology drive
4	Motors	Servo and stepper motors, with or without gearing motor
5	Grippers	Wide range of combination options within handling and assembly technology gripper
6	Adapters	For drive/drive combinations 72 For drive/gripper combinations gripper
7	Installation components	For achieving a clear-cut, safe layout for electrical cables and tubing installation component

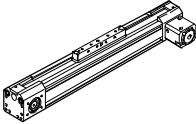
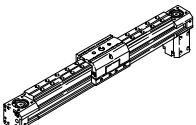
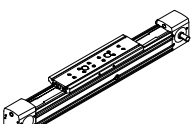
# Toothed belt axes DGE

Selection aid


## Guide characteristics

The data in the table are maximum values. The precise values for each variant can be found in the corresponding data sheet included in the catalogue.



Version	Size	Working stroke <sup>1)</sup> [mm]	Speed [m/s]	Repetition accuracy [mm]	Feed force [N]	Forces and torques					→ Page/Internet
						F <sub>y</sub> [N]	F <sub>z</sub> [N]	M <sub>x</sub> [Nm]	M <sub>y</sub> [Nm]	M <sub>z</sub> [Nm]	
<b>Basic version without guide ZR</b>											
	8	1 ... 650	1	±0.08	15	–	38	0.15	2	0.3	6
	12	1 ... 1000	1.5	±0.08	30	–	59	0.3	4	0.5	
	18	1 ... 1000	2	±0.08	60	–	120	0.5	11	1	
	25	1 ... 3000	5	±0.1	260	–	330	1	20	3	
	40	1 ... 4000	5	±0.1	610	–	800	4	60	8	
	63	1 ... 4500	5	±0.1	1500	–	1600	8	120	24	
<b>With recirculating ball bearing guide ZR-KF</b>											
	8	1 ... 650	3	±0.08	15	255	255	1	3.5	3.5	22
	12	1 ... 1000	3	±0.08	30	565	565	3	9	9	
	18	1 ... 1000	3	±0.08	60	930	930	7	45	45	
	25	1 ... 3000	3	±0.1	260	3080	3080	45	170	170	
	40	1 ... 4000	3	±0.1	610	7300	7300	170	660	660	
	63	1 ... 4500	3	±0.1	1500	14050	14050	580	1820	1820	
<b>With roller guide ZR-RF</b>											
	25	1 ... 5000	10	±0.1	260	260	150	7	30	30	44
	40	1 ... 5000	10	±0.1	610	610	300	18	120	180	
	63	1 ... 5000	10	±0.1	1500	1500	600	65	340	600	

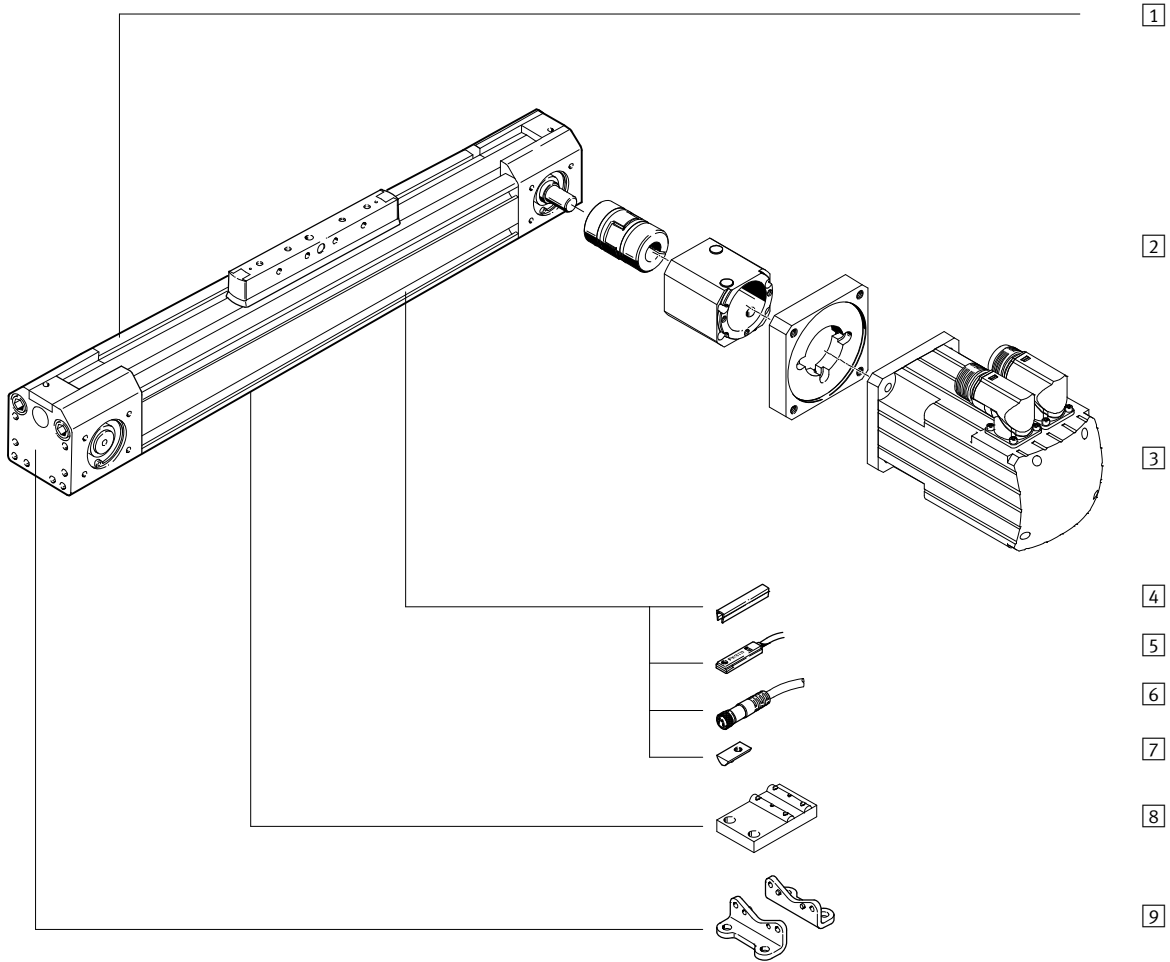
1) Special lengths on request

 Note

Sizing software  
PositioningDrives  
→ [www.festo.com](http://www.festo.com)

# Toothed belt axes DGE-ZR

Peripherals overview



## Toothed belt axes DGE-ZR

Peripherals overview

Variants and accessories		
Type	Description	→ Page/Internet
1 Toothed belt axis DGE-ZR	Electromechanical axis without guide	8
2 Axial kit EAMM-A	For axial motor attachment (consisting of: coupling housing, clamping component, motor flange)	58
3 Motor EMMS	Motors specially matched to the axis, with or without gearing, with or without brake	58
4 Slot cover B/S	For protecting against the ingress of dirt	70
5 Proximity sensor G/H/I/J/N	For use as a proximity signal and safety monitoring	71
6 Cable with socket V	For proximity sensors	71
7 Slot nut for mounting slot Y	For mounting attachments	70
8 Central support M	For mounting the axis	65
9 Foot mounting F	For mounting the axis	64

# Toothed belt axes DGE-ZR

Type code

DGE - 25 - 500 - ZR - LK - RV

**Type**

DGE Toothed belt drive

**Size**

**Stroke [mm]**

**Drive function**

ZR Toothed belt

**Drive shaft on left**

LK	No drive shaft on left
LV	Drive shaft on left, front
LH	Drive shaft on left, rear
LB	Drive shaft on left, front and rear

**Drive shaft on right**

RK	No drive shaft on right
RV	Drive shaft on right, front
RH	Drive shaft on right, rear
RB	Drive shaft on right, front and rear



# Toothed belt axes DGE-ZR

Type code

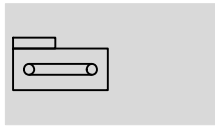


		+ ZUB	-				F	2G	
<b>Accessories</b>									
ZUB	Accessories supplied loose								
<b>Slot cover</b>									
...S	Sensor slot								
...B	Mounting slot								
<b>Slot nut</b>									
...Y	For mounting slot								
<b>Central support</b>									
...M	Central support								
<b>Foot mounting</b>									
...F	Foot mounting								
<b>Proximity sensor</b>									
...G	With cable, 2.5 m								
...H	With plug								
...I	Contactless, with cable, 2.5 m								
...J	Contactless, plug								
...N	NC contact with cable, 2.5 m								
<b>Cable with socket</b>									
...V	2.5 m								

# Toothed belt axes DGE-ZR



Technical data

Function



 [www.festo.com](http://www.festo.com)



-  Size  
8 ... 63
-  Stroke length  
1 ... 4500 mm

General technical data							
Size		8	12	18	25	40	63
Constructional design		Electromechanical axis with toothed belt					
Guide		-					
Mounting position		Any					
Max. working stroke <sup>1)</sup>	[mm]	1 ... 650	1 ... 1000	1 ... 1000	1 ... 3000 <sup>2)</sup>	1 ... 4000 <sup>2)</sup>	1 ... 4500 <sup>2)</sup>
Max. feed force $F_x$	[N]	15	30	60	260	610	1500
Max. radial force <sup>3)</sup>	[N]	103	77	290	307	984	2600
Radial force <sup>4)</sup>	[N]	56	96	117	235	370	840
Radial force <sup>5)</sup>	[N]	40	70	80	140	170	400
Max. driving torque	[Nm]	0.08	0.18	0.5	2.6	9.7	42
Max. no-load driving torque <sup>6)</sup>	[Nm]	0.05	0.08	0.2	0.5	1.0	4.5
Max. speed	[m/s]	1	1.5	2	5	5	5
Max. acceleration	[m/s <sup>2</sup> ]	15	20	20	50	50	50
Repetition accuracy	[mm]	±0.08			±0.1		

- 1) Total stroke = working stroke + 2x stroke reserve
- 2) Special lengths on request
- 3) On the drive shaft
- 4) On the drive shaft, with a service life of 5,000 km
- 5) On the drive shaft, with a service life of 10,000 km
- 6) Measured at a speed of 0.2m/s

Operating and environmental conditions							
Size		8	12	18	25	40	63
Ambient temperature	[°C]	-10 ... +40					
Protection class		IP40					

Weights [kg]							
Size		8	12	18	25	40	63
Basic weight with 0 mm stroke <sup>1)</sup>		0.237	0.31	0.862	1.89	6.05	23.2
Additional weight per 100 mm stroke		0.05	0.08	0.16	0.32	0.51	1.8
Moving load		0,012	0,02	0,055	0,28	0,60	1,80

- 1) Including coupling housing

Mass moment of inertia							
Size		8	12	18	25	40	63
$J_0$	[kg cm <sup>2</sup> ]	0.006	0.015	0.064	0.38	2.34	25.6
$J_H$ per metre stroke	[kg cm <sup>2</sup> /m]	0.003	0.009	0.021	0.078	0.45	3.6
$J_L$ per kg working load	[kg cm <sup>2</sup> /kg]	0.259	0.365	0.685	1	2.53	7.85

The mass moment of inertia  $J_A$  of the entire axis is calculated as follows:

$$J_A = J_0 + J_H \times \text{working stroke [m]} + J_L \times m_{\text{working load [kg]}}$$

# Toothed belt axes DGE-ZR

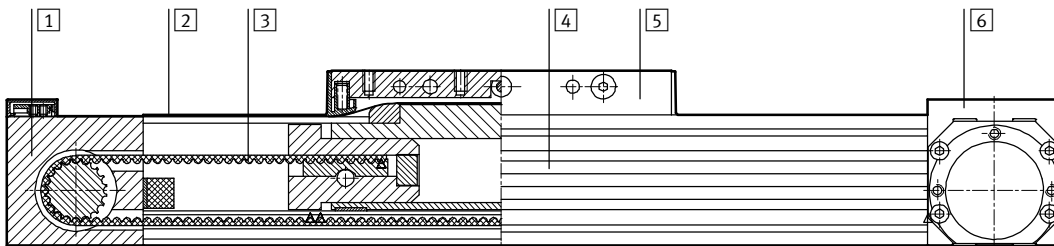
Technical data

Toothed belt							
Size		8	12	18	25	40	63
Tensile stress <sup>1)</sup>	[%]	0.04	0.1	0.2	0.11	0.1	0.15
Pitch	[mm]	2	2	2	3	5	8
Effective diameter	[mm]	10.18	12.09	16.55	20.05	31.83	56.02
Feed constant	[mm/rev.]	32	38	52	63	100	176

1) At max. feed force

## Materials

Sectional view



Axis		
1	Return pulley housing	Anodised aluminium
2	Cover strip	Corrosion resistant steel
3	Toothed belt	Polychloroprene with Glascord and nylon coating
4	Profile	Anodised aluminium
5	Slide	Anodised aluminium
6	Drive housing	Anodised aluminium

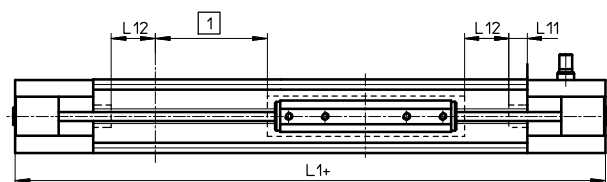
## Stroke reserve

L1+ Overall length of axis  
L11 Internal mechanical stop

1 The working stroke is the effective usable work range. Please quote this in your order.

L12 Stroke reserve:  
Safety distance to mechanical stop, present at both ends of the axis in addition to the stroke

Example:  
Type DGE-25-500-ZR  
Working stroke = 500 mm  
Stroke reserve = (2x 63 mm)  
= 126 mm  
Total stroke:  
626 mm = 500 mm + 126 mm



Size		8	12	18	25	40	63
L12 per end position	[mm]	27.5	36.5	46.5	63	100	172

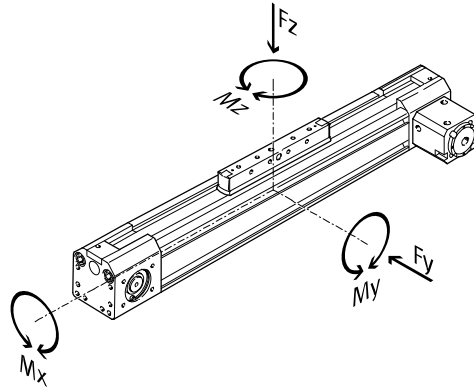
# Toothed belt axes DGE-ZR

Technical data

## Characteristic load values

The indicated forces and torques refer to the centre line of the internal diameter of the profile.

They must not be exceeded in the dynamic range. Special attention must be paid to the cushioning phase.



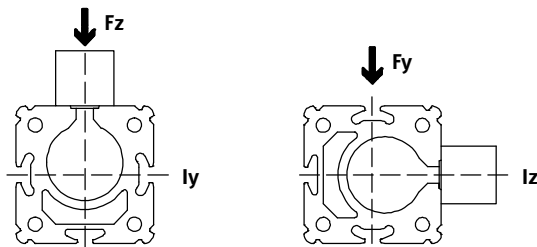
If the drive is subjected to more than two of the indicated forces and torques simultaneously, the following equations must be satisfied in addition to the indicated maximum loads.

$$0.4 \times \frac{F_z}{F_{z_{max}}} + \frac{M_x}{M_{x_{max}}} + \frac{M_y}{M_{y_{max}}} + 0.2 \times \frac{M_z}{M_{z_{max}}} \leq 1$$


$$\frac{F_z}{F_{z_{max}}} \leq 1 \quad \frac{M_z}{M_{z_{max}}} \leq 1$$

Permissible forces and torques		8	12	18	25	40	63
F <sub>y</sub> <sub>max.</sub>	[N]	-	-	-	-	-	-
F <sub>z</sub> <sub>max.</sub>	[N]	38	59	120	330	800	1600
M <sub>x</sub> <sub>max.</sub>	[Nm]	0.15	0.3	0.5	1	4	8
M <sub>y</sub> <sub>max.</sub>	[Nm]	2	4	11	20	60	120
M <sub>z</sub> <sub>max.</sub>	[Nm]	0.3	0.5	1	3	8	24

## 2nd moment of area



Size		8	12	18	25	40	63
ly	[mm <sup>4</sup> ]	6.6x10 <sup>3</sup>	19.7x10 <sup>3</sup>	69.8x10 <sup>3</sup>	224x10 <sup>3</sup>	673x10 <sup>3</sup>	5688x10 <sup>3</sup>
Lz	[mm <sup>4</sup> ]	6.7x10 <sup>3</sup>	19.1x10 <sup>3</sup>	72.3x10 <sup>3</sup>	240x10 <sup>3</sup>	748x10 <sup>3</sup>	6031x10 <sup>3</sup>

-  - Note

Sizing software  
PositioningDrives  
→ [www.festo.com](http://www.festo.com)

# Toothed belt axes DGE-ZR

Technical data

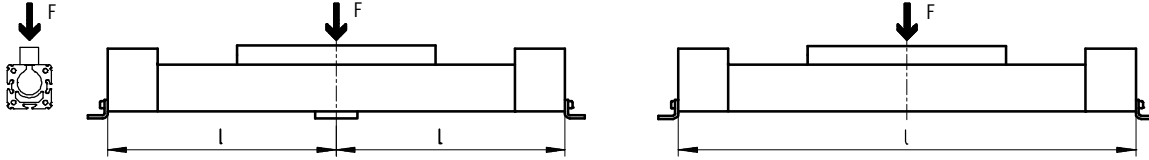
## Maximum permissible support span $l$ as a function of the force $F$

The drive may need to be supported with central supports MUP in order to restrict deflection with long stroke

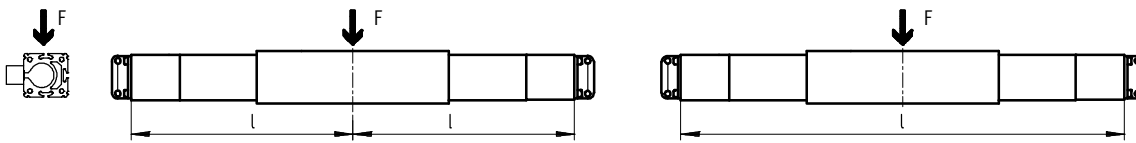
lengths. The following diagrams serve to determine the maximum permissible support span  $l$  as a

function of the force acting upon the drive  $F$ .

### 1 Force on the surface of the slide

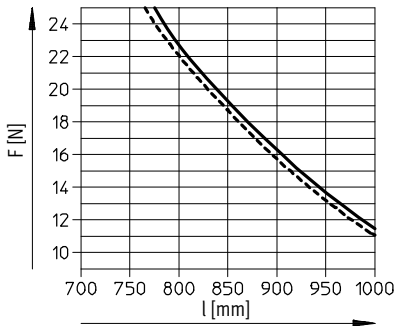


### 2 Force on the front of the slide

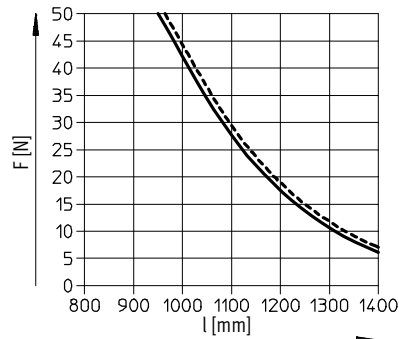


## Maximum permissible support span $l$ (without central support) as a function of the force $F$

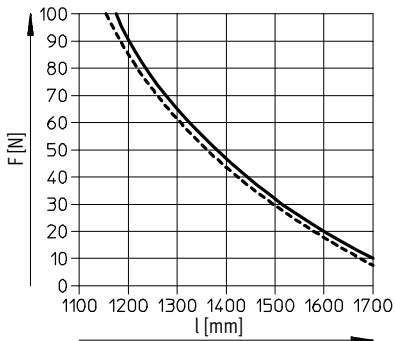
DGE-8



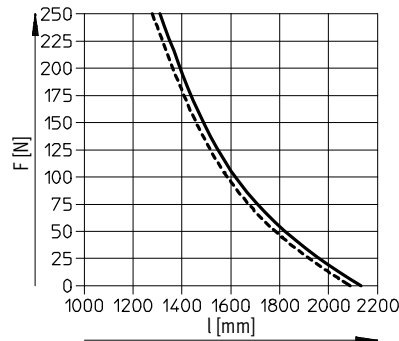
DGE-12



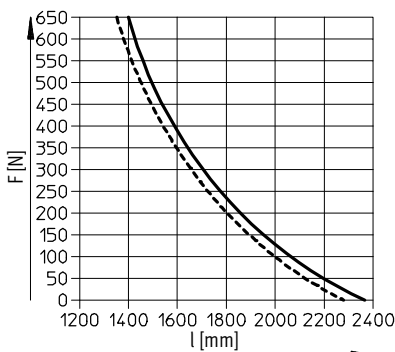
DGE-18



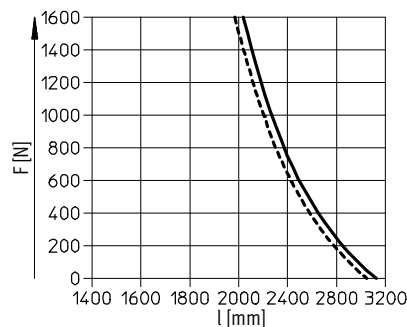
DGE-25



DGE-40



DGE-63



— 1  
- - - 2

# Toothed belt axes DGE-ZR

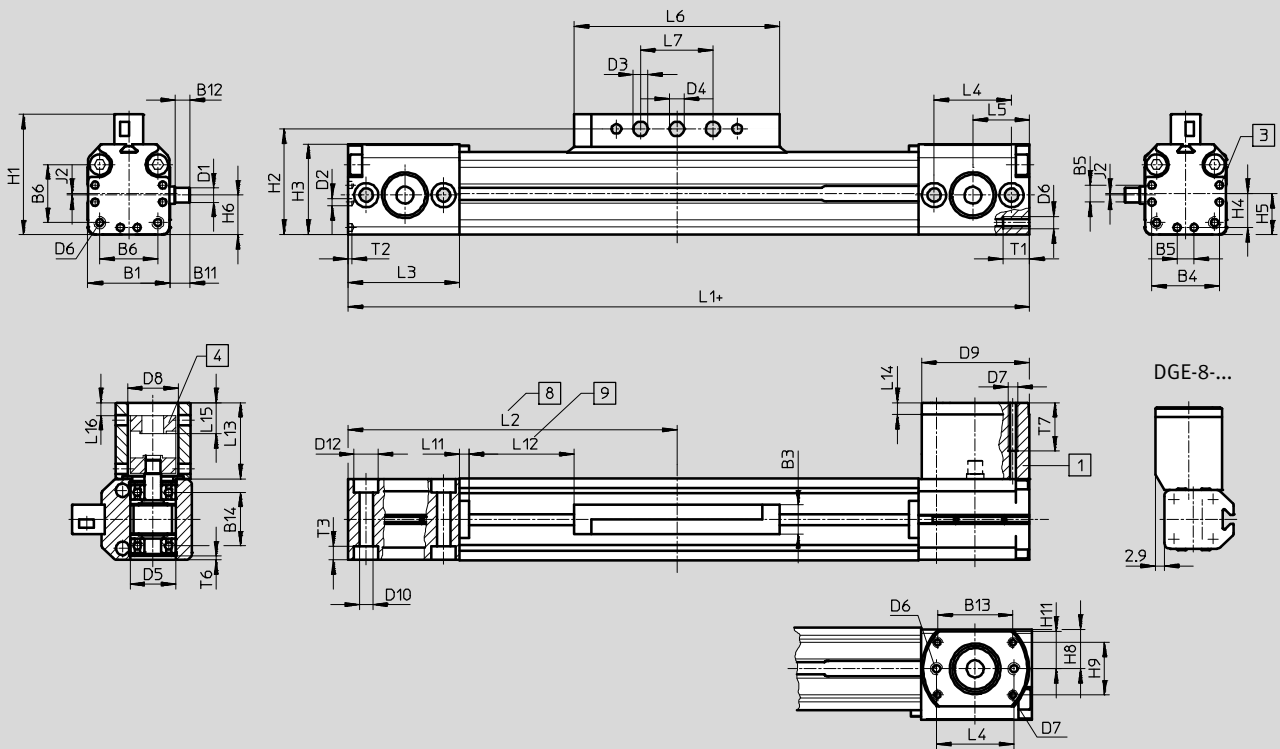
Technical data

FESTO

## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

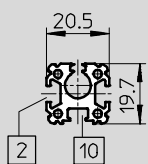
Size 8 ... 18



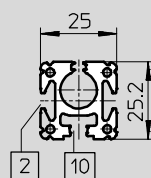
- 1 Coupling housing
- 2 Centring hole for foot mounting
- 3 Coupling
- 4 Driver in end position of working stroke (stroke reserve up to mechanical stop still present)
- 5 Stroke reserve → 11
- 6 + = plus stroke length

## Profile

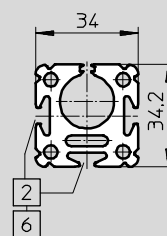
Size 8



Size 12



Size 18



- 2 Sensor slot for proximity sensor
- 6 Mounting slot for slot nut NST
- 10 Not suitable for proximity sensor

# Toothed belt axes DGE-ZR

Technical data

Size	B1 +0.2	B3 ±0.1	B4	B5	B6	B11	B12	B13	B14	D1 ∅ g6	D2 ∅	D3 ∅ H11	D4 ∅ H7	D5 ∅	D6	D7
8	20.5	8	16	4	13	7.3	5	-	12	4	2	3.4	4	12	M3	M3
12	25	8	21	6	18.6	8.7	6.5	22.7	16.2	4	2	3.4	4	16	M3	M3
18	34	12	28	7	24	7.7	5.5	31.1	22	6	3	5.4	6	19	M5	M4

Size	D8 ∅	D9 ∅ g7	D10	D12	H1	H2	H3	H4	H5	H6	H8	H9	H11	J2	L1	L2
8	16	28.7	3.4	6	30	26.5	23.1	8	9.8	8.1	11	0	11	1.7	180	90
12	16	30	3.4	6	35.5	32	28.6	10.5	12.5	11.8	11	13.1	11	0.7	216	108
18	21	44	5.5	10	49.8	43.8	37.6	14	17	16.4	15.5	21.8	15.5	0.6	282	141

Size	L3	L4 ±0.1	L5	L6 +4	L7 ±0.1	L11 ±0.1	L12	L13	L14	L15	L16	T1	T2	T3	T6	T7
8	30	21	15.5	52	15	4	27.5	27.5	5	9.7	3.2	7	1.1	3.4	0.7	18.8
12	33	24	17	64	15	4	36.5	29	5	11.3	4.8	7	1.1	3.4	0.8	29
18	46	32	23.5	85	30	4	46.5	31.5	5	12.8	5.3	11	1.6	5.7	1.5	19

# Toothed belt axes DGE-ZR

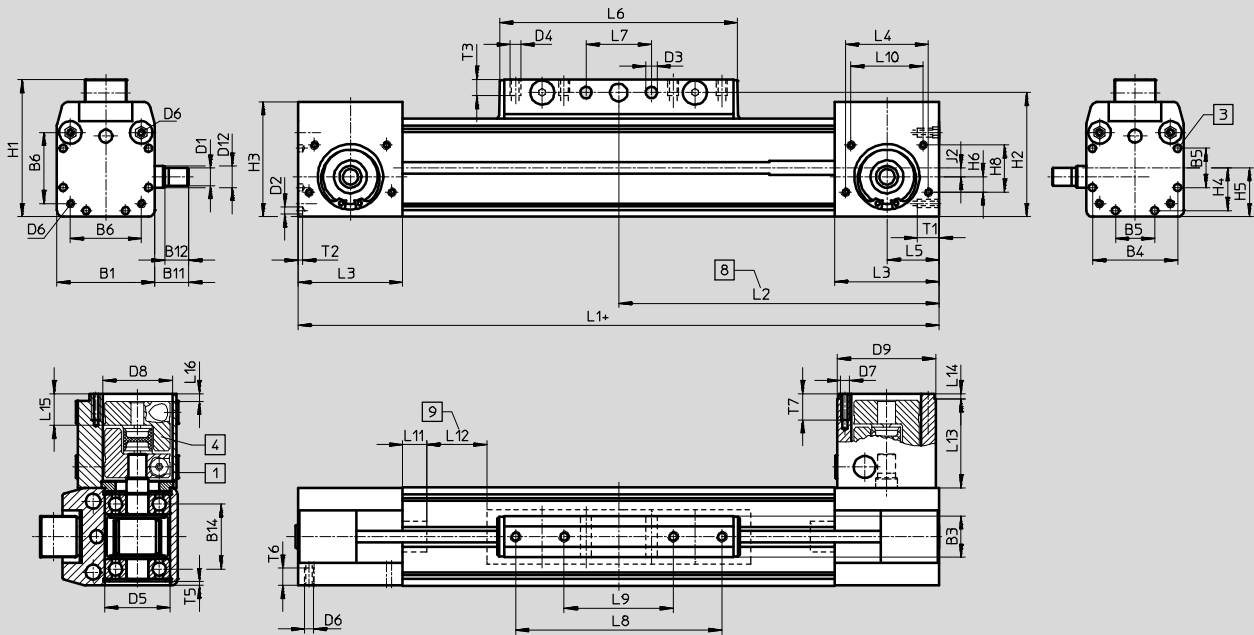
Technical data



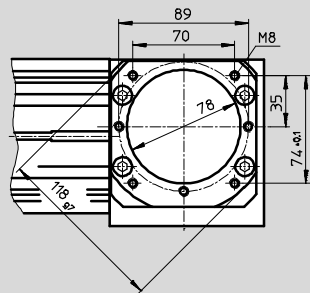
## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

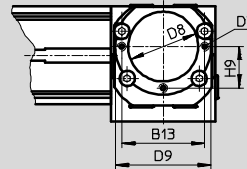
### Size 25 ... 63



### Size 63



### Size 25/40



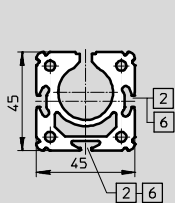
- 1 Coupling housing
- 3 Centring hole for foot mounting HP
- 4 Coupling

- 8 Driver in end position of working stroke (stroke reserve up to mechanical stop still present)

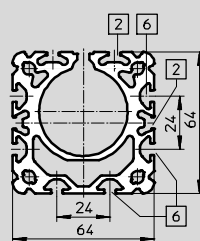
- 9 Stroke reserve → 11
- + = plus stroke length

## Profile

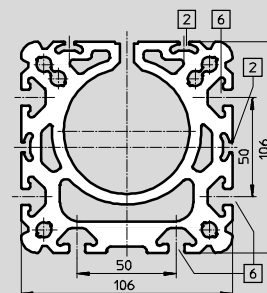
### Size 25



### Size 40



### Size 63



- 2 Sensor slot for proximity sensor
- 6 Mounting slot for slot nut NST



# Toothed belt axes DGE-ZR

Technical data

Size	B1	B3 +0.2	B4	B5	B6	B11	B12	B13	B14	D1 ∅ h6	D2 ∅	D3 ∅ +0.2	D4
25	45	19	39.1	18	32.5	15.5	11	38	29.8	8	3.3	5.2	M5
40	64	21	53	28	49	30	24.5	56	43.5	15	4.3	6.5	M6
63	106	24	89	44	83	41	35	-	77.7	25	6.3	8.5	M8

Size	D5 ∅ H7	D6	D7	D8 ∅	D9 ∅ g7	D12 ∅	H1	H2	H3	H4	H5	H6	H8
25	30	M4	M4	32	44	10	63	57	52.8	19.6	22.5	7	21.6
40	40	M5	M6	48	64	17	86	78	71.8	26.5	32	11.5	31
63	62	M8	M8	78	-	31	131	122	115	44.5	53	21.5	49

Size	H9 ±0.1	J2	L1	L2	L3	L4	L5	L6	L7 ±0.1	L8 ±0.1	L9 ±0.1	L10
25	19	4.1	372	186	48	38	24	109	30	-	50	33
40	28	5	569	284.5	67	54	34	171	70	130	40	54
63	35	6.5	882	441	106	84	55	234	110	190	70	84

Size	L11	L12	L13	L14	L15	L16 <sup>1)</sup>	T1	T2	T3	T5	T6	T7
25	11	63	40	3.2	14.6	3.6	10	2	7.5	1.4	8	10
40	15	100	65	4	22.8	-2.2	12	3	10.5	1.9	10	13
63	15	172	91	5	35	0	21	4	12.5	4.5	15	16

1) Negative dimension: Protrudes above coupling housing

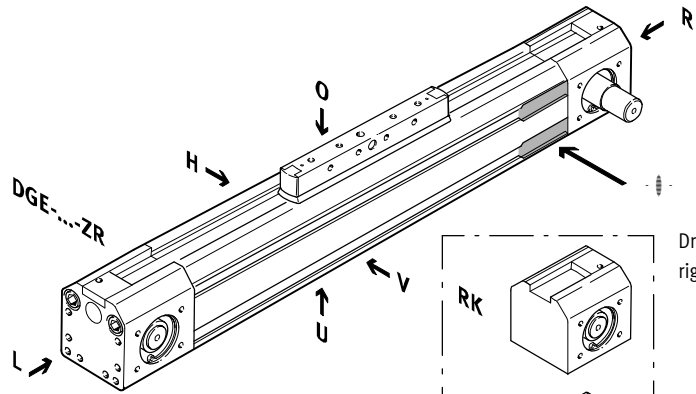
# Toothed belt axes DGE-ZR

Ordering data – Modular products

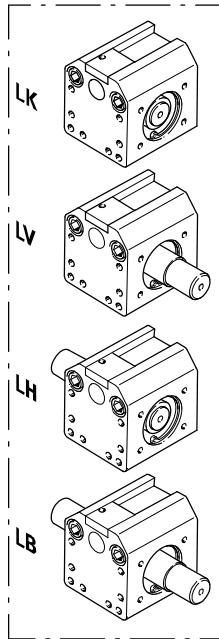
## Order code

### Mandatory data

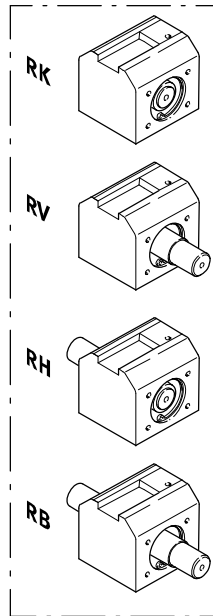
- LK No drive shaft on left
- LV Drive shaft on left, front
- LH Drive shaft on left, rear
- LB Drive shaft on left, front and rear
- RK No drive shaft on right
- RV Drive shaft on right, front
- RH Drive shaft on right, rear
- RB Drive shaft on right, front and rear



Drive shaft left



Drive shaft right



-  - Note

The insertion point for the proximity sensor is located on the right side of the toothed belt axis DGE-ZR

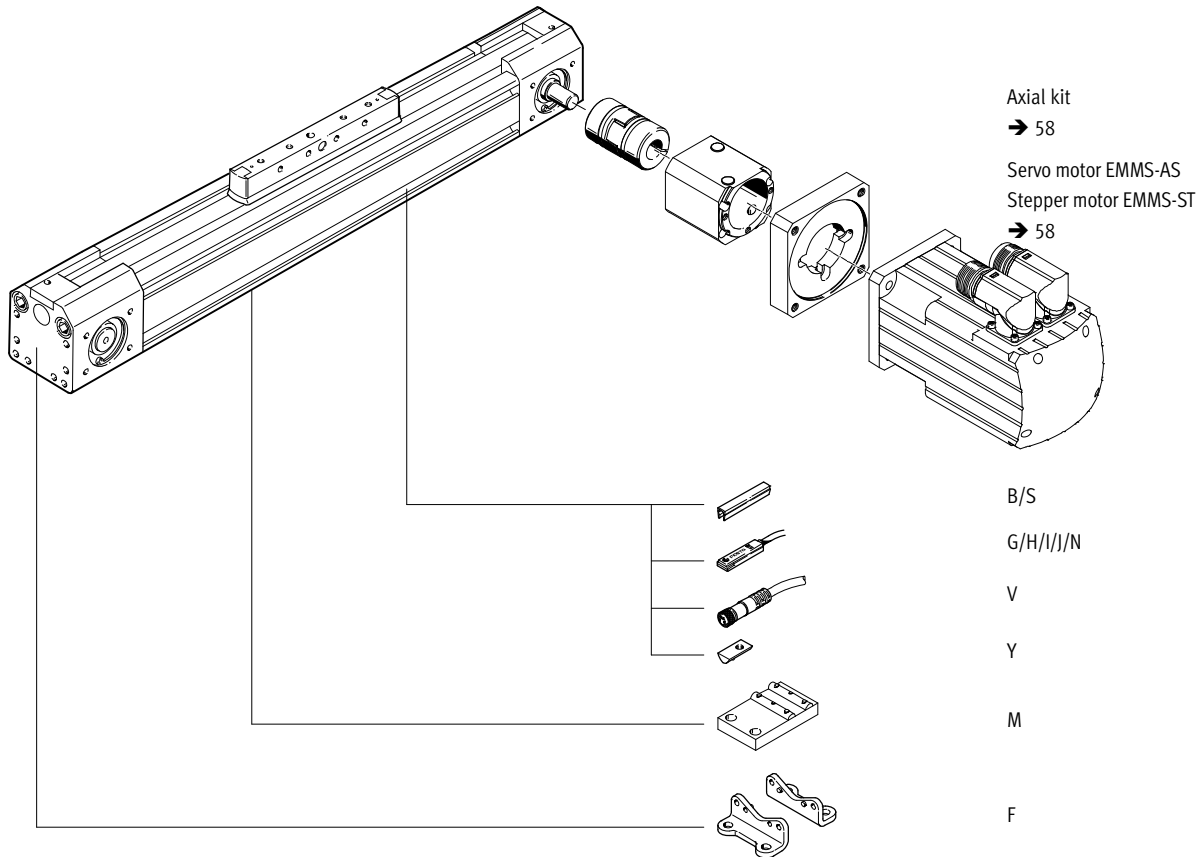
- O top
- U underneath
- R right
- L left
- V front
- H rear

# Toothed belt axes DGE-ZR

Ordering data – Modular products

## Order code

Options



# Toothed belt axes DGE-ZR

Ordering data – Modular products

**M** Mandatory data →

Module No.	Design	Size	Stroke	Drive function	Drive shaft on left	Drive shaft on right
193739	DGE	8	1 ... 4 500	ZR	LK	RK
193740		12			LV	RV
193741		18			LH	RH
193742		25			LB	RB
193743		40				
193744		63				
<b>Ordering example</b>						
193742	DGE	25	500	ZR	LK	RV

**Ordering table**

Size	8	12	18	25	40	63	Condi- tions	Code	Enter code	
<b>M</b> Module No.	193739	193740	193741	193742	193743	193744				
Design	Electromechanical linear axis							DGE	DGE	
Size	8	12	18	25	40	63	-...			
Stroke [mm]	1 ... 650	1 ... 1000		1 ... 3000	1 ... 4000	1 ... 4500	1	-...		
Drive function	Electromechanical drive with toothed belt							-ZR	-ZR	
Drive shaft on left	No drive shaft on left							2	-LK	
	Drive shaft on left, front								-LV	
	Drive shaft on left, rear								-LH	
	Drive shaft on left, front and rear								-LB	
Drive shaft on right	No drive shaft on right							3	-RK	
	Drive shaft on right, front								-RV	
	Drive shaft on right, rear								-RH	
	Drive shaft on right, front and rear								-RB	

1 **Stroke** Special stroke lengths:  
 Module No. 8: 1000 mm  
 Module No. 12: 1400 mm  
 Module No. 18: 1700 mm  
 Module No. 25: 5100 mm  
 Module No. 40: 4900 mm  
 Module No. 63: 4700 mm

2 **LK** Not with drive shaft on right RK.  
 3 **RK** Not with drive shaft on left LK.

**Transfer order code**

DGE -  -  - ZR -  -

# Toothed belt axes DGE-ZR

Ordering data – Modular products



Options						
Accessories	Slot cover	Slot nut	Central support	Foot mounting	Proximity sensor	Plug socket
ZUB	...S ...B	...Y	...M	...F	...G ...H ...I ...J ...N	...V
<b>ZUB</b>	- <b>2S</b>	<b>10Y</b>		<b>F</b>	<b>2G</b>	<b>2V</b>

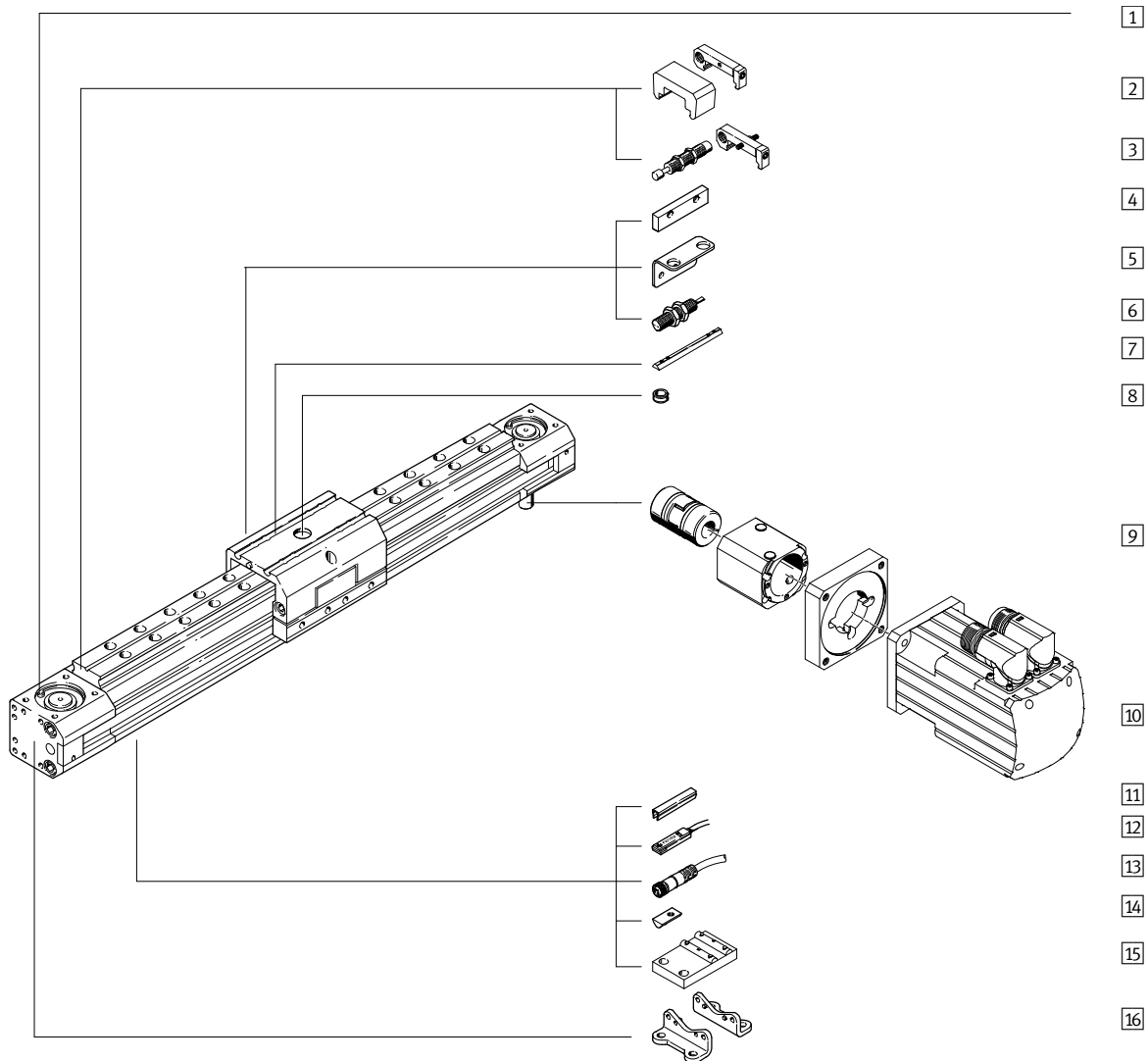
Ordering table											
Size		8	12	18	25	40	63	Condi- tions	Code	Enter code	
↓	Accessories	Supplied separately							ZUB-		ZUB-
0	Slot cover	Sensor slot	1 ... 10							...S	
		Mounting slot	-	-	-	-	1 ... 10		...B		
	Slot nut	for mounting slot	-	-	1 ... 10				...Y		
	Central support	1 ... 10							...M		
	Foot mounting (kit)	1 ... 10							...F		
	Proximity sensor	with cable 2.5 m	1 ... 10							...G	
		with plug	1 ... 10							...H	
		contactless with cable 2.5 m	1 ... 10							...I	
		contactless, plug	1 ... 10							...J	
		NC contact with cable 2.5 m	1 ... 10							...N	
	Cable with socket, 2.5 m	1 ... 10							...V		

Transfer order code

ZUB -

# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Peripherals overview



# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Peripherals overview

Variants and accessories				
Type	Description	GK/GV	GA	→ Page/Internet
1) Toothed belt axis DGE-ZR-KF	Electromechanical axis with toothed belt and recirculating ball bearing guide	■	■	24
2) Emergency buffer with retainer <sup>1)</sup> A	For avoiding damage at the end stop in the event of malfunction	■	■	67
3) Shock absorber kits C	For avoiding damage at the end stop in the event of malfunction	■	-	66
3) Shock absorber kits E	For avoiding damage at the end stop in the event of malfunction	-	■	67
4) Switching lug L	For sensing the slide position	■	-	68
5) Sensor bracket T	Adapter for mounting the inductive proximity sensors on the axis	■	-	68
6) Inductive proximity sensor O/P/R/W	For use as a proximity signal and safety monitoring	■	-	71
7) Slot nut for slide X	For mounting loads and attachments on the slide	■	■	70
8) Centring pins/sleeves Z	For centring loads and attachments on the slide	■	■	70
9) Axial kit EAMM-A	For axial motor attachment (consisting of: coupling housing, clamping component, motor flange)	■	■	58
10) Motor EMMS	Motors specially matched to the axis, with or without gearing, with or without brake	■	■	58
11) Slot cover B/S	For protecting against the ingress of dirt	■	■	70
12) Proximity sensor G/H/I/J/N	For use as a proximity signal and safety monitoring	■	■	71
13) Cable with socket V	For proximity sensors	■	■	71
14) Slot nut for mounting slot Y	For mounting attachments	■	■	70
15) Central support M	For mounting the axis	■	■	65
16) Foot mounting F	For mounting the axis	■	■	64

1) Fitted as standard for GV and GA

# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Type code

DGE - 25 - 500 - ZR - LK - RV - KF - GK - KL

**Type**

DGE Toothed belt drive

**Size**

**Stroke [mm]**

**Drive function**

ZR Toothed belt

**Drive shaft on left**

LK	No drive shaft on left
LV	Drive shaft on left, front
LH	Drive shaft on left, rear
LB	Drive shaft on left, front and rear

**Drive shaft on right**

RK	No drive shaft on right
RV	Drive shaft on right, front
RH	Drive shaft on right, rear
RB	Drive shaft on right, front and rear

**Guide**

KF Recirculating ball bearing guide

**Slide**

GK	Standard slide
GV	Extended slide
GA	Protected version

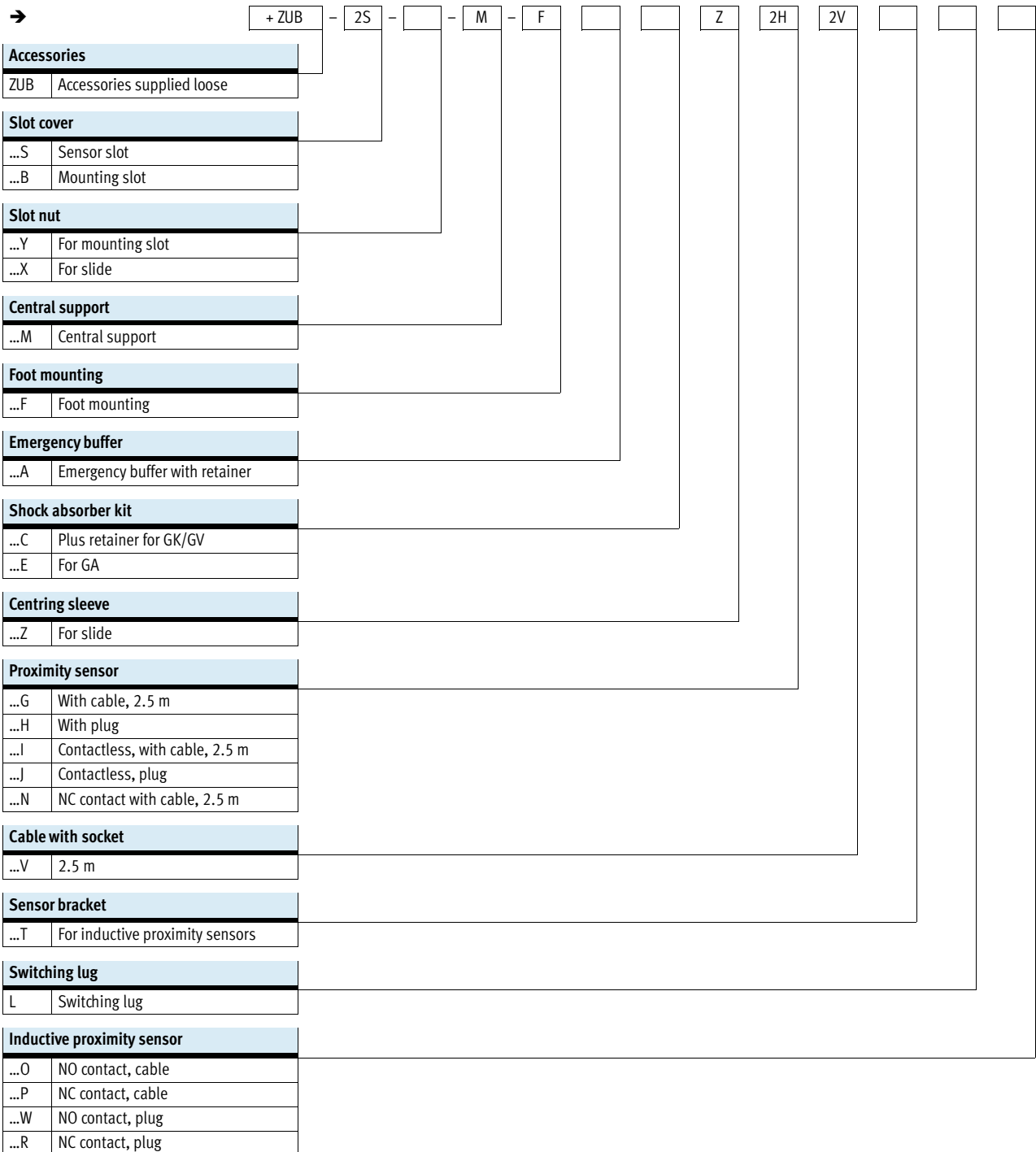
**Additional slide**

KL	Left
KR	Right



# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Type code

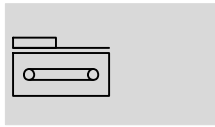


# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

FESTO



Technical data

Function



 www.festo.com



-  Size  
8 ... 63
-  Stroke length  
1 ... 4500 mm

General technical data		8	12	18	25	40	63
Size		8	12	18	25	40	63
Constructional design		Electromechanical axis with toothed belt and recirculating ball bearing guide					
Guide		Recirculating ball bearing guide					
Mounting position		Any					
Max. working stroke <sup>1)</sup>	GK [mm]	1 ... 650	1 ... 1000	1 ... 1000	1 ... 3000 <sup>2)</sup>	1 ... 4000 <sup>2)</sup>	1 ... 4500 <sup>2)</sup>
	GV [mm]	–	–	1 ... 920	1 ... 2900	1 ... 3830	1 ... 4250
	GA [mm]	–	–	–	1 ... 1800	1 ... 1800	–
Max. working load	[kg]	1.5	3	6	20	50	120
Max. feed force $F_x$	[N]	15	30	60	260	610	1500
Max. radial force <sup>3)</sup>	[N]	103	77	290	307	984	2600
Radial force <sup>4)</sup>	[N]	56	96	117	235	370	840
Radial force <sup>5)</sup>	[N]	40	70	80	140	170	400
Max. driving torque	[Nm]	0.08	0.18	0.5	2.6	9.7	42
Max. no-load driving torque <sup>6)</sup>	[Nm]	0.05	0.08	0.2	0.5	1.0	4.5
Max. speed	[m/s]	3	3	3	3	3	3
Max. acceleration	[m/s <sup>2</sup> ]	15	20	20	50	50	50
Repetition accuracy	[mm]	±0.08			±0.1		

- 1) Total stroke = working stroke + 2x stroke reserve
- 2) Special lengths on request
- 3) On the drive shaft
- 4) On the drive shaft, with a service life of 5,000 km
- 5) On the drive shaft, with a service life of 10,000 km
- 6) Measured at a speed of 0.2 m/s

Operating and environmental conditions		8	12	18	25	40	63
Size		8	12	18	25	40	63
Ambient temperature	[°C]	–10 ... +40					
Protection class		IP40					

Weights [kg]		8	12	18	25	40	63
Size		8	12	18	25	40	63
Basic weight with 0 mm stroke <sup>1)</sup>	GK	0.32	0.66	1.16	2.6	7.6	30.3
	GV	–	–	1.62	3.52	9.52	40.2
	GA	–	–	–	3.51	9.67	–
Additional weight per 100 mm stroke	GK/GV	0.095	0.14	0.26	0.47	0.94	2.6
	GA	–	–	–	0.56	1.06	–
Moving load	GK	0,085	0,14	0,32	0,71	1,8	5
	GV	–	–	0,48	0,97	2,52	7,46
	GA	–	–	–	1,27	3,17	–
Additional slide	KL/KR	–	–	0.25	0.38	1.06	3.1

- 1) Including coupling housing and slide

# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Technical data

Mass moment of inertia		8	12	18	25	40	63
J <sub>0</sub>	GK [kg cm <sup>2</sup> ]	0.025	0.058	0.247	0.81	5.25	50.7
	GV [kg cm <sup>2</sup> ]	–	–	0.355	1.08	7.14	70.9
	GA [kg cm <sup>2</sup> ]	–	–	–	1.37	8.71	–
J <sub>H</sub> per metre stroke	[kg cm <sup>2</sup> /m]	0.003	0.009	0.021	0.078	0.45	3.6
J <sub>L</sub> per kg working load	[kg cm <sup>2</sup> /kg]	0.259	0.365	0.685	1	2.53	7.85

The mass moment of inertia J<sub>A</sub> of the entire axis is calculated as follows:

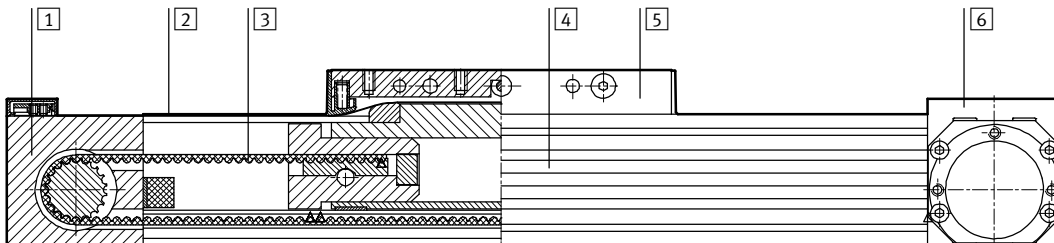
$$J_A = J_0 + J_H \times \text{working stroke [m]} + J_L \times m_{\text{working load [kg]}}$$

Toothed belt		8	12	18	25	40	63
Tensile stress <sup>1)</sup>	[%]	0.04	0.1	0.2	0.11	0.1	0.15
Pitch	[mm]	2	2	2	3	5	8
Effective diameter	[mm]	10.18	12.09	16.55	20.05	31.83	56.02
Feed constant	[mm/rev.]	32	38	52	63	100	176

1) At max. feed force

## Materials

Sectional view



Axis		
1	Return pulley housing	Anodised aluminium
2	Cover strip	Corrosion resistant steel
3	Toothed belt	Polychloroprene with Glascord and nylon coating
4	Profile	Anodised aluminium
5	Slide	Anodised aluminium
6	Drive housing	Anodised aluminium

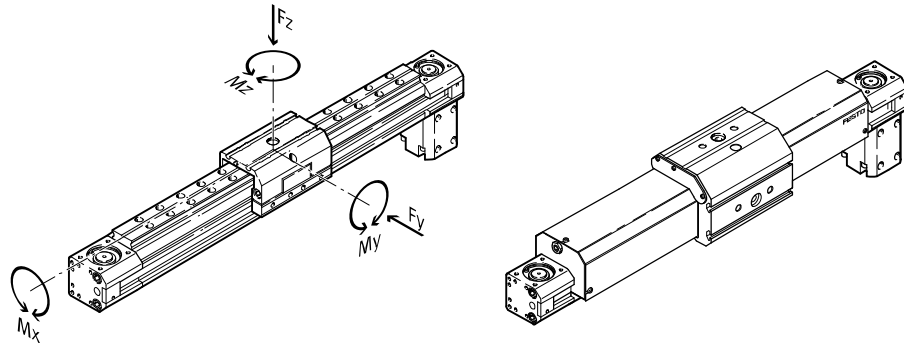
# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Technical data



## Characteristic load values for axis with standard slide GK or protected version GA

The indicated forces and torques refer to the centre of the guide rail. They must not be exceeded in the dynamic range. Special attention must be paid to the cushioning phase.

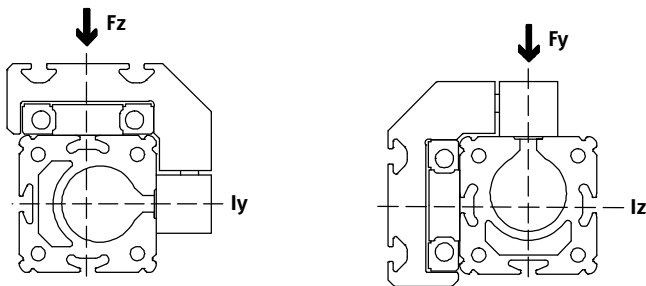


If the axis is subjected to more than two of the indicated forces and torques simultaneously, the following equations must be satisfied in addition to the indicated maximum loads.

$$\frac{F_y}{F_{y_{max}}} + \frac{F_z}{F_{z_{max}}} + \frac{M_x}{M_{x_{max}}} + \frac{M_y}{M_{y_{max}}} + \frac{M_z}{M_{z_{max}}} \leq 1$$

Permissible forces and torques		8	12	18	25	40	63
F <sub>y</sub> <sub>max.</sub>	[N]	255	565	930	3080	7300	14050
F <sub>z</sub> <sub>max.</sub>	[N]	255	565	930	3080	7300	14050
M <sub>x</sub> <sub>max.</sub>	[Nm]	1	3	7	45	170	580
M <sub>y</sub> <sub>max.</sub>	[Nm]	3.5	9	23	85	330	910
M <sub>z</sub> <sub>max.</sub>	[Nm]	3.5	9	23	85	330	910

## 2nd moment of area



Size		8	12	18	25	40	63
l <sub>y</sub>	[mm <sup>4</sup> ]	16.9x10 <sup>3</sup>	46x10 <sup>3</sup>	172x10 <sup>3</sup>	551x10 <sup>3</sup>	1908x10 <sup>3</sup>	13677x10 <sup>3</sup>
l <sub>z</sub>	[mm <sup>4</sup> ]	7x10 <sup>3</sup>	21x10 <sup>3</sup>	73.7x10 <sup>3</sup>	250x10 <sup>3</sup>	875x10 <sup>3</sup>	6987x10 <sup>3</sup>

- - Note

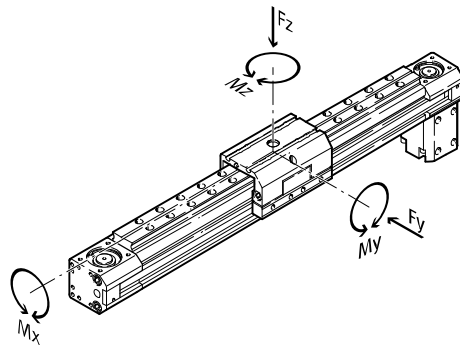
Sizing software  
PositioningDrives  
→ [www.festo.com](http://www.festo.com)

# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Technical data

## Characteristic load values for axis with extended slide GV

The indicated forces and torques refer to the centre of the guide rail. They must not be exceeded in the dynamic range. Special attention must be paid to the cushioning phase.

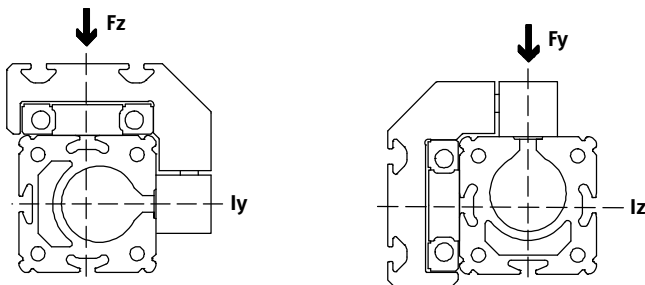


If the axis is subjected to more than two of the indicated forces and torques simultaneously, the following equations must be satisfied in addition to the indicated maximum loads.

$$\frac{F_y}{F_{y_{max}}} + \frac{F_z}{F_{z_{max}}} + \frac{M_x}{M_{x_{max}}} + \frac{M_y}{M_{y_{max}}} + \frac{M_z}{M_{z_{max}}} \leq 1$$

Permissible forces and torques							
Size		8	12	18	25	40	63
F <sub>y</sub> <sub>max.</sub>	[N]	255	565	930	3080	7300	14050
F <sub>z</sub> <sub>max.</sub>	[N]	255	565	930	3080	7300	14050
M <sub>x</sub> <sub>max.</sub>	[Nm]	1	3	7	45	170	580
M <sub>y</sub> <sub>max.</sub>	[Nm]	–	–	45	170	660	1820
M <sub>z</sub> <sub>max.</sub>	[Nm]	–	–	45	170	660	1820

## 2nd moment of area



Size		8	12	18	25	40	63
l <sub>y</sub>	[mm <sup>4</sup> ]	16.9x10 <sup>3</sup>	46x10 <sup>3</sup>	172x10 <sup>3</sup>	551x10 <sup>3</sup>	1908x10 <sup>3</sup>	13677x10 <sup>3</sup>
l <sub>z</sub>	[mm <sup>4</sup> ]	7x10 <sup>3</sup>	21x10 <sup>3</sup>	73.7x10 <sup>3</sup>	250x10 <sup>3</sup>	875x10 <sup>3</sup>	6987x10 <sup>3</sup>

# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Technical data

## Stroke reserve

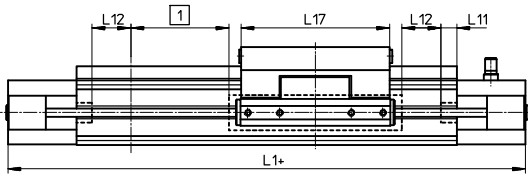
- L1+ Overall length of axis
- L11 Internal mechanical stop
- L17 Slide length
- 3 Emergency buffer
- 4 Shock absorber retainer

1 The working stroke is the effective usable work range. Please quote this in your order.

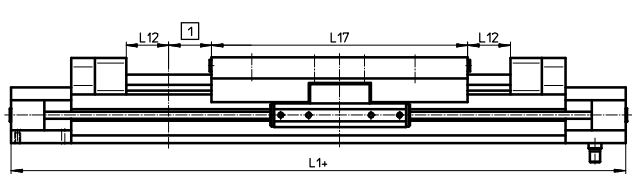
L12 Stroke reserve:  
Safety distance to mechanical stop, present at both ends of the axis in addition to the stroke.

Example:  
Type DGE-25-500-ZR  
Working stroke = 500 mm  
Stroke reserve = (2x 63 mm) = 126 mm  
Total stroke:  
626 mm = 500 mm + 126 mm

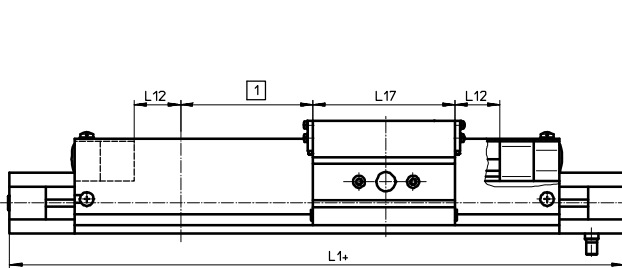
### for standard slide GK



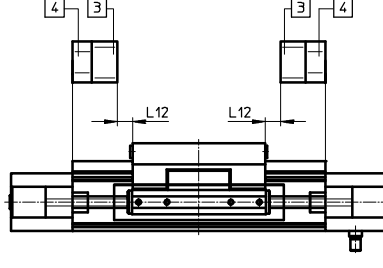
### for extended slide GV



### for protected version GA



### for standard slide GK with optional emergency buffer

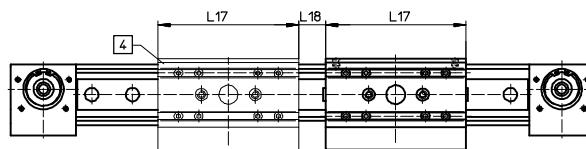


## Stroke reserve L12 [mm] per end position

Size Variant	8	12	18	25	40	63
Standard slide GK	27.5	36.5	46.5	63	100	172
Standard slide GK with optional emergency buffer	-	-	23.5	41.5	62	116
Extended slide GV	-	-	23.5	41.5	62	116
Protected version GA	-	-	-	41.5	62	-

## Working stroke reduction with standard slide GK or extended slide GV and additional slide KL/KR

- L17 = Slide/additional slide length
- L18 = Distance between both slides
- 4 Additional slide



For a toothed belt axis with additional slide, the working stroke is reduced by the length of the additional slide and the distance between both slides.

Example:  
Type DGE-25-500-ZR-...-KF-GK-KL  
Working stroke without additional slide = 500 mm  
L18 = 20 mm  
L17 = 105 mm  
Working stroke with additional slide = 375 mm  
(500 mm - 20 mm - 105 mm)

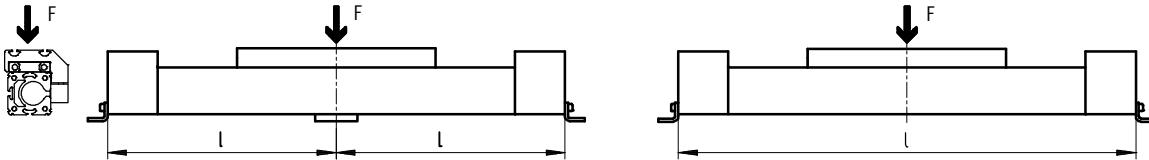
# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Technical data

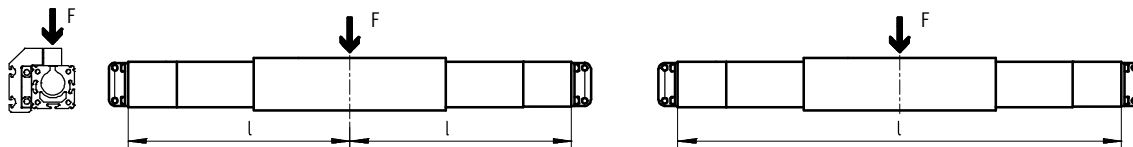
## Maximum permissible support span $l$ as a function of the force $F$

The axis may need to be supported with central supports MUP in order to restrict deflection with long stroke lengths. The following diagrams serve to determine the maximum permissible support span  $l$  as a function of the force acting upon the axis  $F$ .

### 1] Force on the surface of the slide

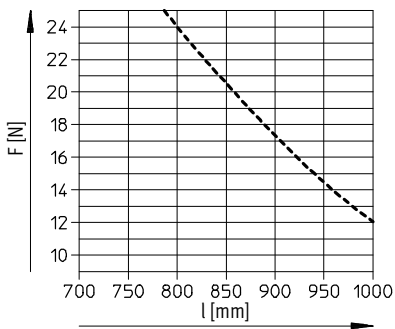


### 2] Force on the front of the slide

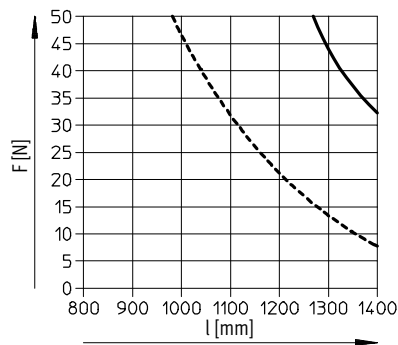


## Maximum support span $l$ (without central support) as a function of the force $F$

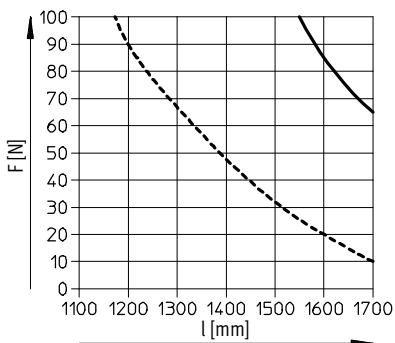
DGE-8



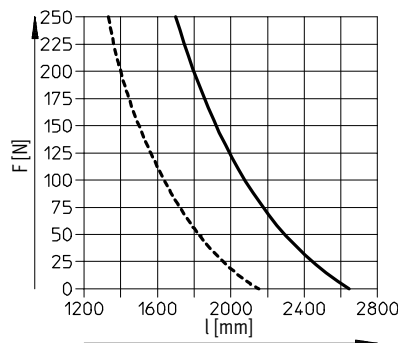
DGE-12



DGE-18



DGE-25



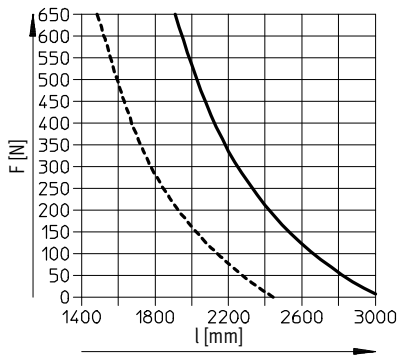
- 1
- - - 2

# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

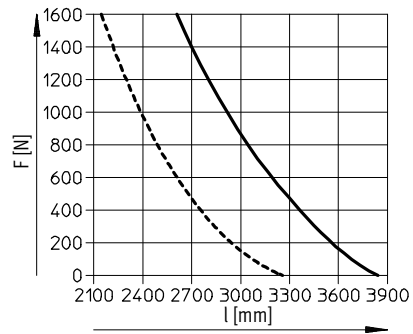
Technical data

Maximum support span  $l$  (without central support) as a function of the force  $F$

DGE-40



DGE-63



- 1
- - - 2



# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

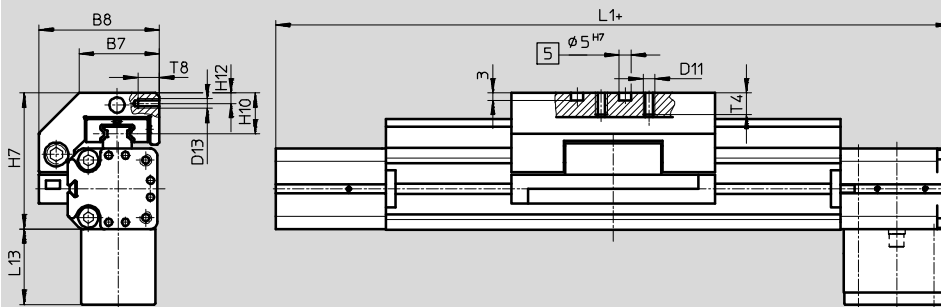
Technical data

## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Standard slide GK

Size 8 ... 18



- 5 Hole for centring pin ZBS-5
- + = plus stroke length

Basic dimensions

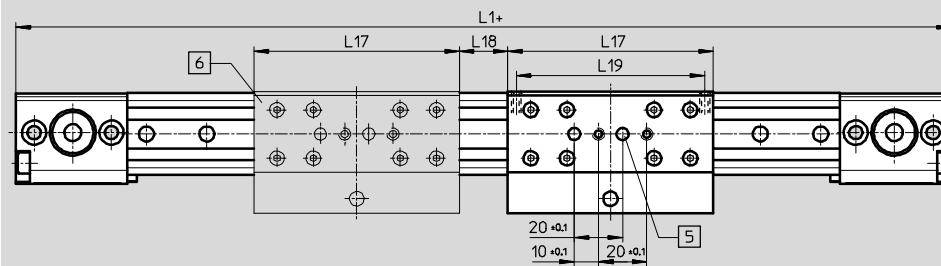
→ 14

Stroke reserve

→ 30

Additional slide KL/KR

Size 18



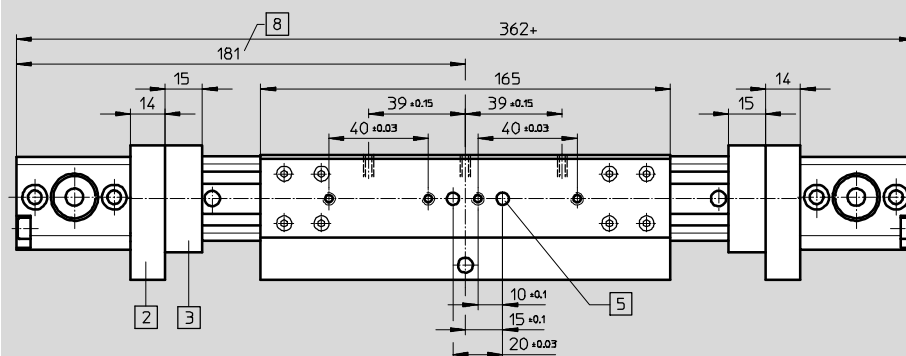
- 5 Hole for centring pin ZBS-5
- 6 Additional slide
- + = plus stroke length

Reduction of working stroke

→ 30

Extended slide GV

Size 18



- 2 Shock absorber retainer KYP
- 3 Emergency buffer NPE
- 5 Hole for centring pin ZBS-5
- 8 Driver in end position of working stroke (stroke reserve up to mechanical stop still present)
- + = plus stroke length

Stroke reserve

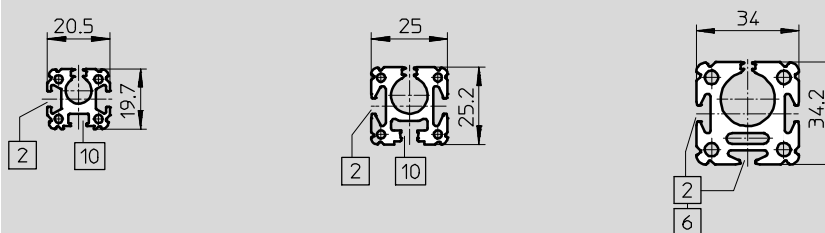
→ 30

Profile

Size 8

Size 12

Size 18



- 2 Sensor slot for proximity sensor
- 6 Mounting slot for slot nut NST
- 10 Not suitable for proximity sensor

Size	B7	B8	D11	D13	H7	H10	H12	L1	L13	L17	L18	L19	T4	T8
8	21.5	32	M4	-	35.5	12	-	180	27.5	52	-	-	7	-
12	22	36.5	M4	-	43.5	14	-	216	29	64	-	-	8.5	-
18	32	50.5	M5	M4	57	17	4.3	282	31.5	85	20	78	10	9

# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

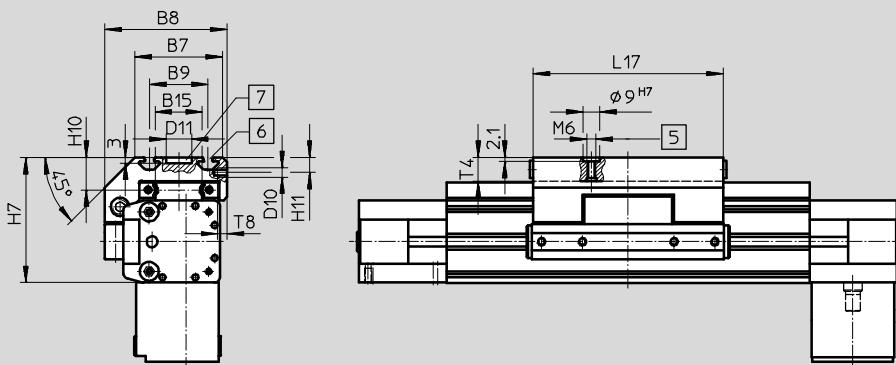
Technical data

## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

Standard slide GK

Size 25 ... 63



- 5 Hole for centring sleeve ZBH-9
- 6 Mounting slot for slot nut NSTL
- 7 Hole for central mounting SLZZ

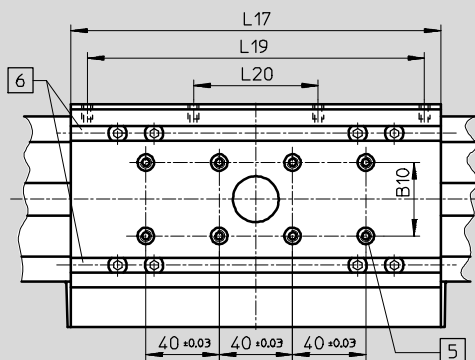
Basic dimensions

→ 16

Stroke reserve

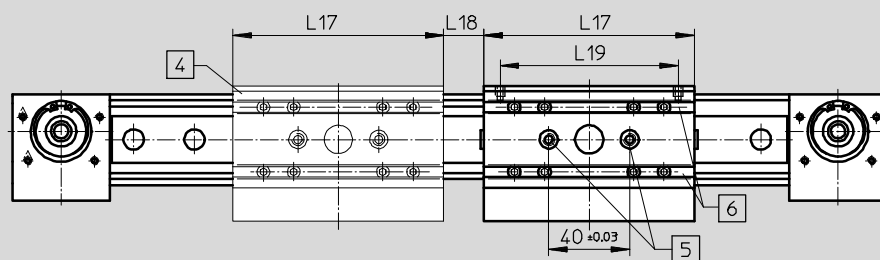
→ 30

Size 40/63



- 5 Hole for centring sleeve ZBH-9
- 6 Mounting slot for slot nut NSTL

Size 25 ... 63



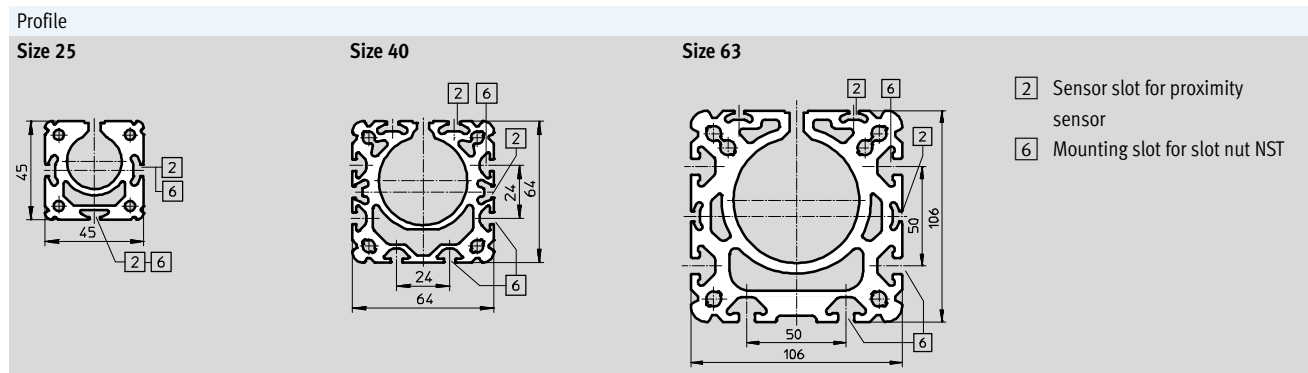
- 4 Additional slide DGE-...-KL/KR
- 5 Hole for centring sleeve ZBH-9
- 6 Mounting slot for slot nut NSTL

Reduction of working stroke

→ 30

# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Technical data



Size	B7	B8	B9 ±0.2	B10	B15	D10	D11 ∅ G7	H7
25	48	67	32	-	23.5	M5	14	68.5
40	78.5	96.5	55	20	42	M5	25	90.5
63	121	142	90	40	71	M8	25	144.5

Size	H10	H11	L17	L18 <sup>1)</sup>	L19 ±0.1	L20 ±0.1	T4 max.	T8
25	18.5	8.2	105	20	88	-	12.5	8.5
40	20	7	167	20	150	58	12.5	8.5
63	30	12.5	230	27	200	72	20.5	10.5

1) Recommended minimum distance for access to lubrication nipple.

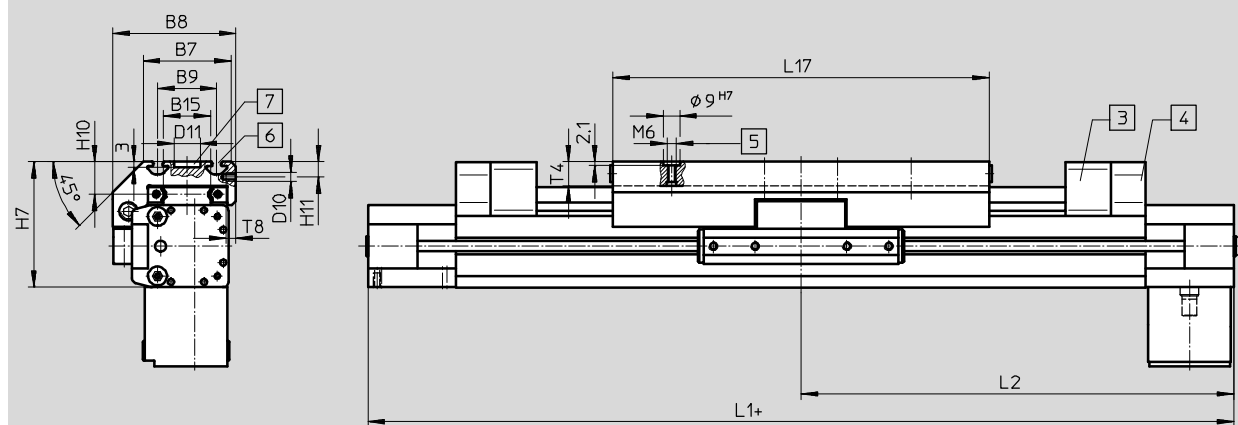
# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Technical data

Dimensions Download CAD data → [www.festo.com](http://www.festo.com)

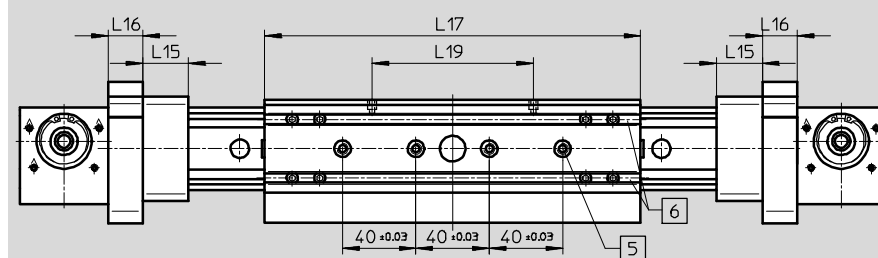
Extended slide GV

Size 25 ... 63



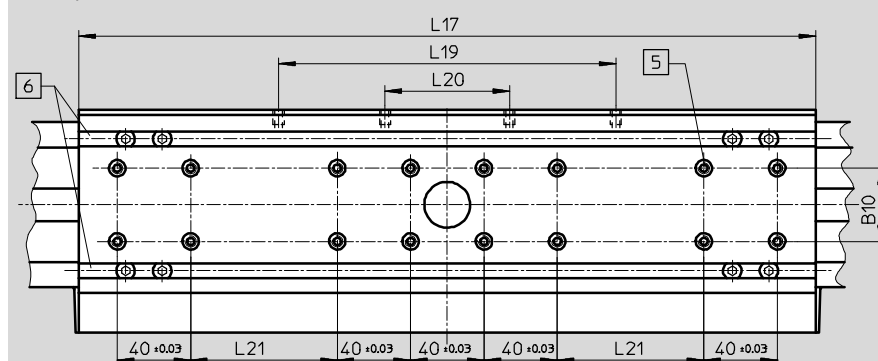
- |   |  |  |  |
|---|--|--|--|
| <span style="border: 1px solid black; padding: 2px;">3</span> Emergency buffer NPE        | <span style="border: 1px solid black; padding: 2px;">5</span> Hole for centring sleeve ZBH-9 | <span style="border: 1px solid black; padding: 2px;">7</span> Hole for central mounting SLZZ | Basic dimensions<br>→ 16<br>Stroke reserve<br>→ 30 |
| <span style="border: 1px solid black; padding: 2px;">4</span> Shock absorber retainer KYP | <span style="border: 1px solid black; padding: 2px;">6</span> Slot for slot nut NSTL         | + = plus stroke length   |  |

Size 25



- |  |
|--|
| <span style="border: 1px solid black; padding: 2px;">5</span> Hole for centring sleeve ZBH-9 |
| <span style="border: 1px solid black; padding: 2px;">6</span> Slot for slot nut NSTL         |

Size 40/63



- |  |
|--|
| <span style="border: 1px solid black; padding: 2px;">5</span> Hole for centring sleeve ZBH-9 |
| <span style="border: 1px solid black; padding: 2px;">6</span> Slot for slot nut NSTL         |

# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Technical data

Size	B7	B8	B9 ±0.2	B15	D10	D11 ∅ G7	H7	H10	H11
25	48	67	32	23.5	M5	14	68.5	18.5	8.2
40	78.5	96.5	55	42	M5	25	90.5	20	7
63	121	142	90	71	M8	25	144.5	30	12.5

Size	L1	L2	l15	L16	L17 ±0.2	L19 ±0.1	L20 ±0.1	L21 ±0.1	T4 max.	T8
25	472	236	25	19	205	88	–	–	12.5	8.5
40	739	369.5	40	32	337	150	58	40	12.5	8.5
63	1132	566	60	44	480	200	72	120	20.5	10.5

# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

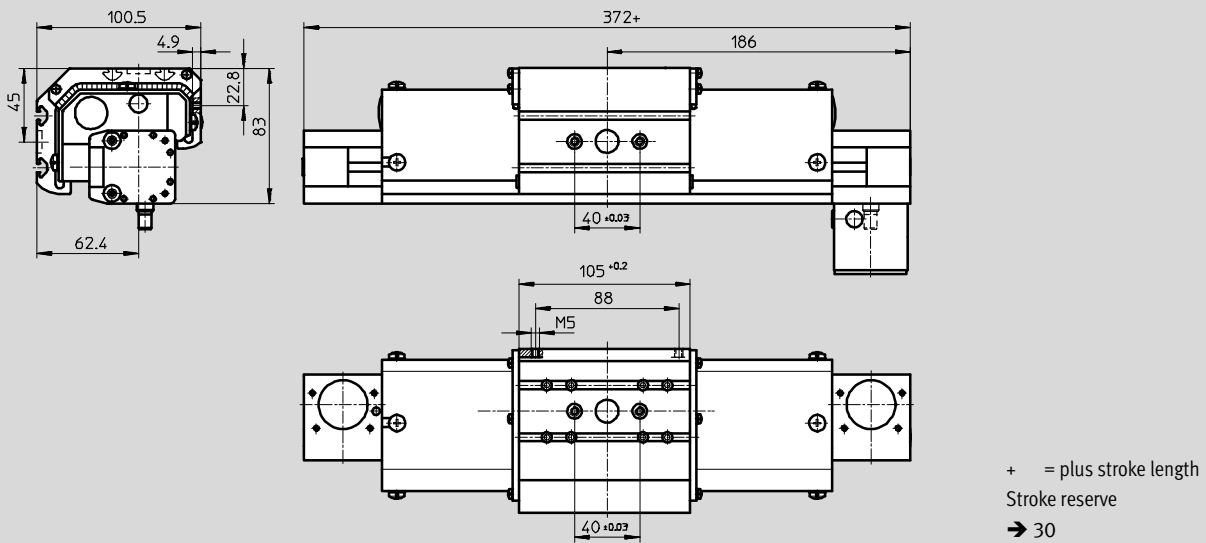
Technical data

## Dimensions

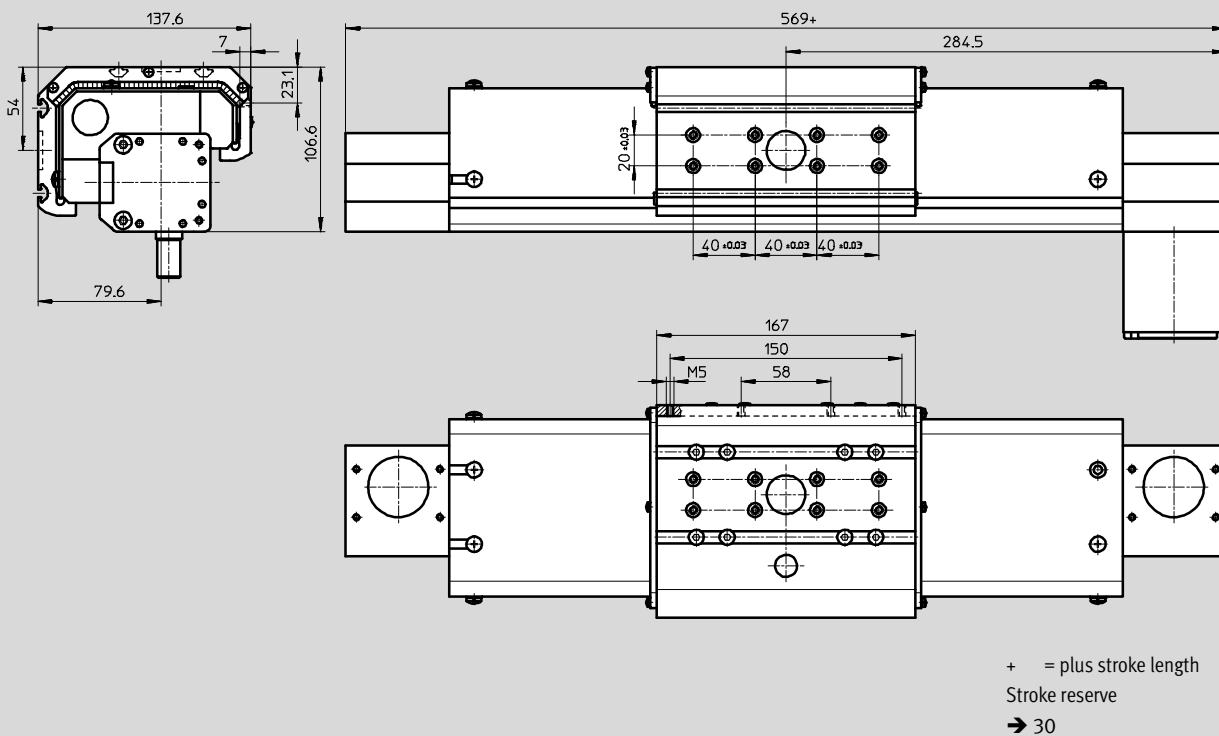
Download CAD data → [www.festo.com](http://www.festo.com)

Protected version GA

### Size 25



### Size 40



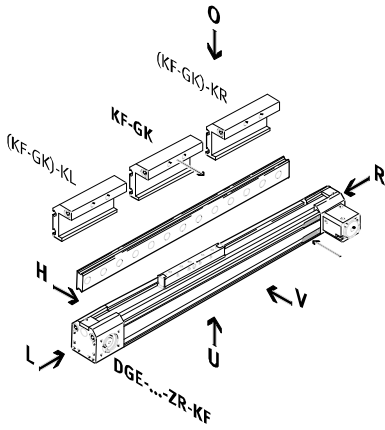
# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Ordering data – Modular products

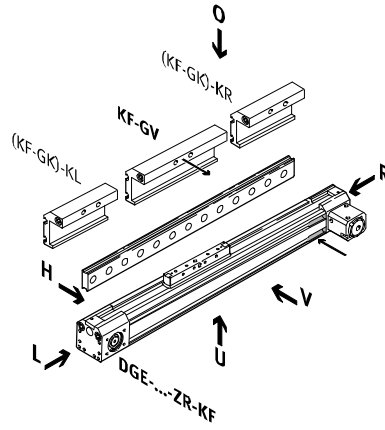
## Order code

Mandatory data

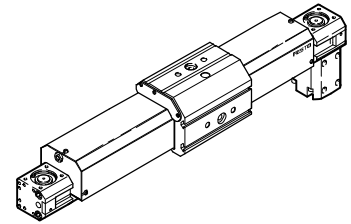
Standard slide GK



Extended slide GV

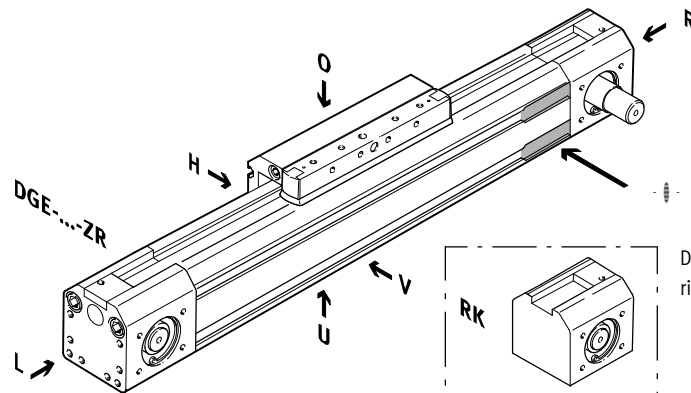


Protected version GA

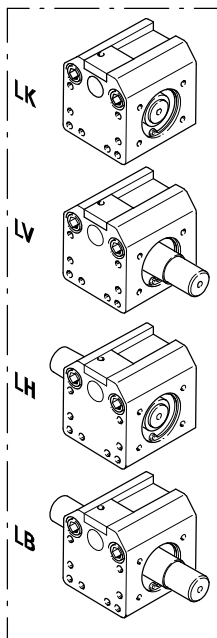


## Drive shaft

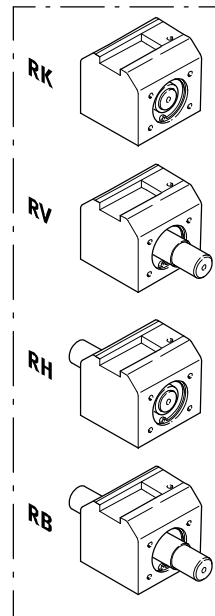
- LK No drive shaft on left
- LV Drive shaft on left, front
- LH Drive shaft on left, rear
- LB Drive shaft on left, front and rear
- RK No drive shaft on right
- RV Drive shaft on right, front
- RH Drive shaft on right, rear
- RB Drive shaft on right, front and rear



Drive shaft left



Drive shaft right



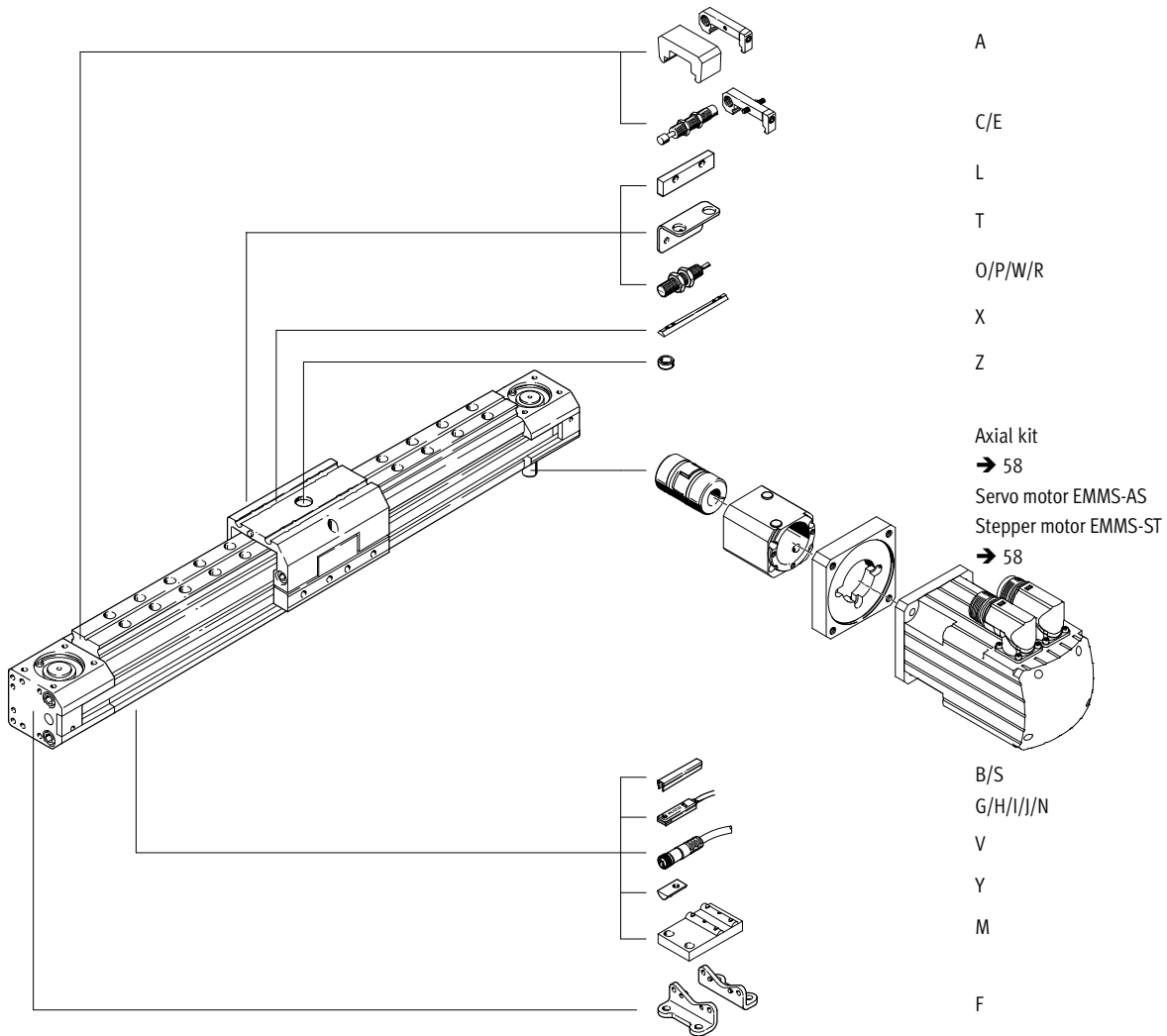
- Note

The insertion point for the proximity sensor is located on the right side of the toothed belt axis

- O top
- U underneath
- R right
- L left
- V front
- H rear

# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Ordering data – Modular products





# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Ordering data – Modular products

**M** Mandatory data →

Module No.	Design	Size	Stroke	Drive function	Drive shaft on left	Drive shaft on right
193739	DGE	8	1 ... 4500	ZR	LK LV LH LB	RK RV RH RB
193740		12				
193741		18				
193742		25				
193743		40				
193744		63				
<b>Ordering example</b>						
<b>193743</b>	<b>DGE</b>	<b>- 40</b>	<b>- 800</b>	<b>- ZR</b>	<b>- LK</b>	<b>- RV</b>

**Ordering table**

Size	8	12	18	25	40	63	Condi- tions	Code	Enter code
<b>M</b> Module No.	<b>193739</b>	<b>193740</b>	<b>193741</b>	<b>193742</b>	<b>193743</b>	<b>193744</b>			
Design	Electromechanical linear axis							<b>DGE</b>	DGE
Size	8	12	18	25	40	63	-...		
Stroke [mm]	1 ... 650	1 ... 1000		1 ... 3000	1 ... 4000	1 ... 4500	<b>1</b>	-...	
Drive function	Electromechanical drive with toothed belt							<b>-ZR</b>	-ZR
Drive shaft on left	No drive shaft on left						<b>2</b>	<b>-LK</b>	
	Drive shaft on left, front							<b>-LV</b>	
	Drive shaft on left, rear							<b>-LH</b>	
	Drive shaft on left, front and rear							<b>-LB</b>	
Drive shaft on right	No drive shaft on right						<b>3</b>	<b>-RK</b>	
	Drive shaft on right, front							<b>-RV</b>	
	Drive shaft on right, rear							<b>-RH</b>	
	Drive shaft on right, front and rear							<b>-RB</b>	

**1 Stroke** Special stroke lengths:  
 Module No. 8: 1000 mm  
 Module No. 12: 1400 mm  
 Module No. 18: 1700 mm  
 Module No. 25: 5100 mm  
 Module No. 40: 4900 mm  
 Module No. 63: 4700 mm

**2 LK** Not with drive shaft on right RK.  
**3 RK** Not with drive shaft on left LK.

**Transfer order code**

**DGE** -  -  - **ZR** -  -

# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Ordering data – Modular products

Options		
<b>Guide</b>	<b>Slide</b>	<b>Additional slide</b>
KF	GK GV GA	KL KR
- <b>KF</b>	- <b>GK</b>	-

Ordering table										
Size	8	12	18	25	40	63	Condi- tions	Code	Enter code	
0 Guide	Recirculating ball bearing guide						4	-KF	-KF	
Slide	Standard						5	-GK		
	Extended (maximum stroke for DGE-...-ZR-KF-GV)		Extended (920 mm)   (2 900 mm)   (3 830 mm)   (4 250 mm)				6	-GV		
	Dust protection (maximum stroke for DGE-...-ZR-KF-GA)		Dust proof version (1 800 mm)   (1 800 mm)   -				6	-GA		
Additional slide	Left (effective stroke reduction)		Standard slide left (85 mm)   (105 mm)   (167 mm)   (230 mm)				7	-KL		
	Right (effective stroke reduction)		Standard slide right (85 mm)   (105 mm)   (167 mm)   (230 mm)				7	-KR		

- 4 **KF** Only with slide GK, GV, GA.
- 5 **GK** Emergency buffer recommended → Accessory option "A".
- 6 **GV,GA** Emergency buffer is scope of delivery
- 7 **KL, KR** Only with slide GK or GV.  
Emergency buffer recommended → Accessory option "A".

Transfer order code

-  -  -

# Toothed belt axes DGE-ZR-KF, with recirculating ball bearing guide

Ordering data – Modular products

Options												
Accessories	Slot cover	Slot nut	Central support	Foot mounting	Emergency buffer and retainer	Shock absorber	Centring sleeve	Proximity sensor	Plug socket	Sensor bracket	Switching lug	Inductive sensor
ZUB	...S ...B	...Y ...X	...M	...F	...A	...C ...E	...Z	...G ...H ...I ...J ...N	...V	...T	...L	...O ...P ...W ...R
ZUB	- 2S2B	10Y2X		F				2I				

Ordering table																		
Size	8	12	18	25	40	63	Conditions	Code	Enter code									
Accessories	Supplied separately								ZUB-		ZUB-							
Slot cover	Sensor slot										1 ... 10			...S				
	Mounting slot										-	-	-	-	1 ... 10		...B	
Slot nut	for mounting slot										-	-	1 ... 10			...Y		
	for slide										-	-	-	1 ... 10			...X	
Central support	1 ... 10															...M		
Foot mounting (kit)	1 ... 10															...F		
Emergency buffer and retainer for KF	-		-		1 ... 2			[8]					...A					
Shock absorber and retainer for KF-GK, KF-GV	-		-		1 ... 2			[9]					...C					
	-		-		-		1 ... 2		-	[10]			...E					
Centring sleeve (pack of 10)	10, 20, 30, 40, 50, 60, 70, 80, 90														...Z			
Proximity sensor	with cable 2.5 m										1 ... 10				...G			
	with plug										1 ... 10				...H			
	contactless with cable 2.5 m										1 ... 10				...I			
	contactless, plug										1 ... 10				...J			
	NC contact with cable 2.5 m										1 ... 10				...N			
Cable with socket 2.5 m	1 ... 10														...V			
Sensor bracket for inductive sensors	-		-		1 ... 5			[9]					...T					
Switching lug	-		-		1			[9]					L					
Inductive sensor	-		-		1 ... 5			[9]					...O					
	-		-		1 ... 5			[9]					...P					
	-		-		1 ... 5			[9]					...W					
	-		-		1 ... 5			[9]					...R					

[8] **A** Only with slide GK.  
Mounted as standard for slide GV, GA

[10] **E** Only with slide GA.

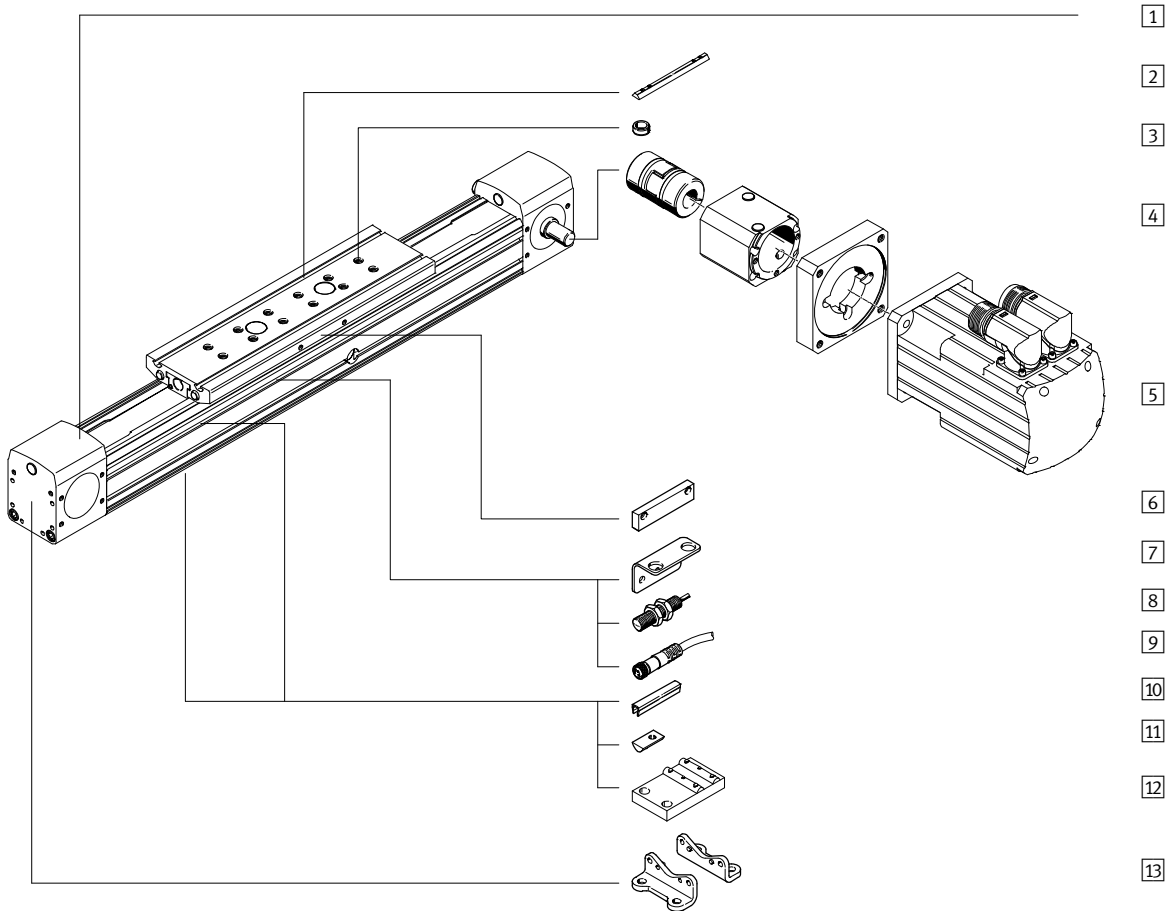
[9] **C, T, L, O, P, W, R**  
Not with slide GA.

**Transfer order code**

ZUB -

# Toothed belt axes DGE-ZR-RF, with roller guide

Peripherals overview



## Toothed belt axes DGE-ZR-RF, with roller guide

Peripherals overview

Variants and accessories		
Type	Description	→ Page/Internet
1 Toothed belt axis DGE-RF	Electromechanical axis with roller guide	48
2 Slot nut for slide X	For mounting loads and attachments on the slide	70
3 Centring sleeve Z	For centring loads and attachments on the slide	70
4 Axial kit EAMM-A	For axial motor attachment (consisting of: coupling housing, clamping component, motor flange)	58
5 Motor EMMS	Motors specially matched to the axis, with or without gearing, with or without brake	58
6 Switching lug L	For sensing the slide position	68
7 Sensor bracket T	Adapter for mounting the sensors on the axis	68
8 Inductive proximity sensor O/P/W/R	For use as a proximity signal and safety monitor	71
9 Cable with socket V	For proximity sensors	71
10 Slot cover B	For protecting against the ingress of dirt	70
11 Slot nut for profile slot Y	For mounting attachments	70
12 Central support M	For mounting the axis	65
13 Foot mounting F	For mounting the axis	64

# Toothed belt axes DGE-ZR-RF, with roller guide

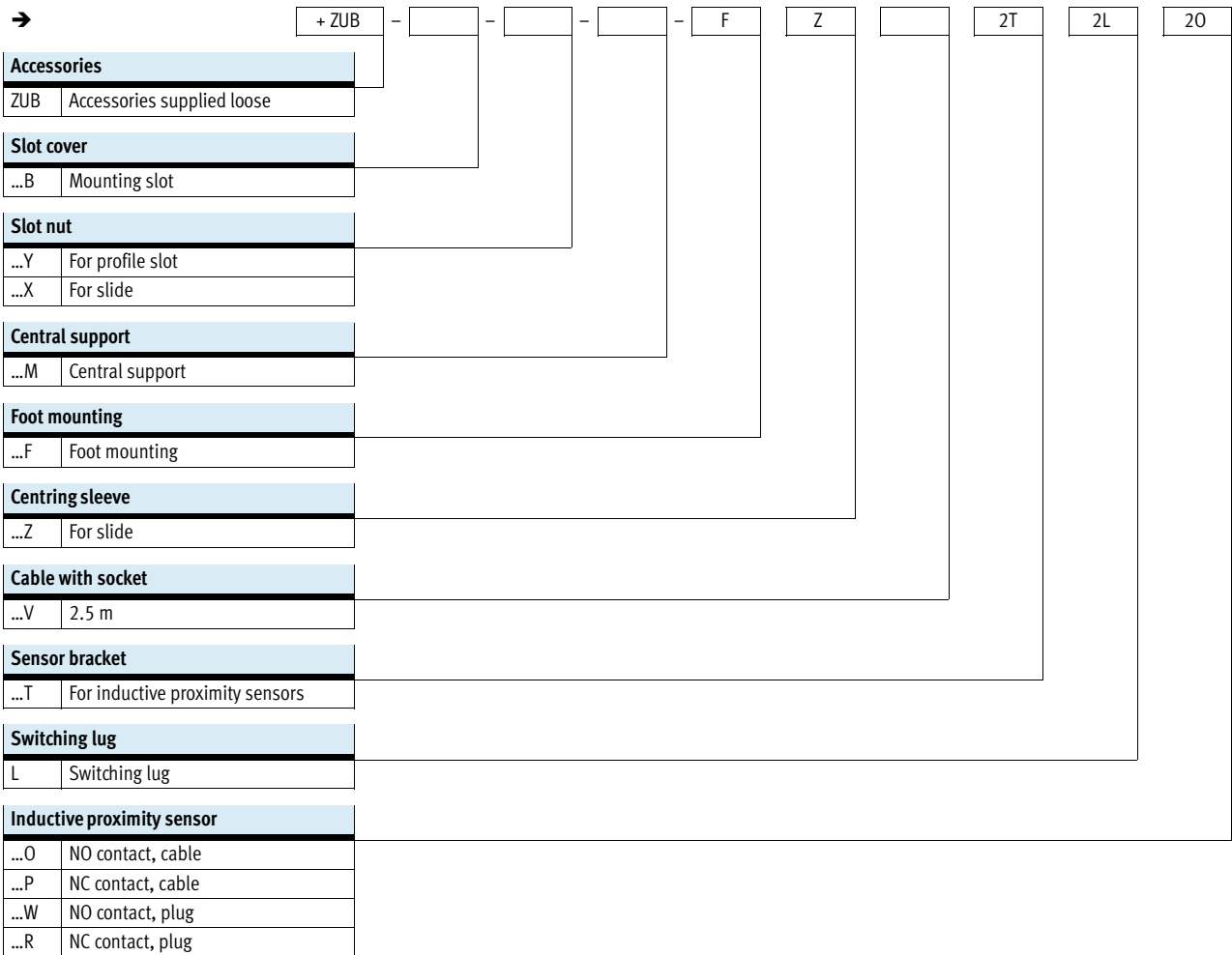
Type code

DGE - 25 - 500 - ZR - RF - LK - RV - GK

Type	
DGE	Toothed belt drive
Size	
Stroke [mm]	
Drive function	
ZR	Toothed belt
Guide	
RF	Roller guide
Drive shaft on left	
LK	No drive shaft on left
LV	Drive shaft on left, front
LH	Drive shaft on left, rear
LB	Drive shaft on left, front and rear
Drive shaft on right	
RK	No drive shaft on right
RV	Drive shaft on right, front
RH	Drive shaft on right, rear
RB	Drive shaft on right, front and rear
Slide	
GK	Standard slide
GV	Extended slide

# Toothed belt axes DGE-ZR-RF, with roller guide

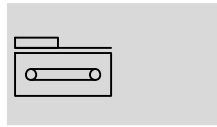
Type code



# Toothed belt axes DGE-ZR-RF, with roller guide

## Technical data

### Function



- - Size  
25, 40 and 63
- - Stroke length  
1 ... 5000 mm



General technical data				
Size		25	40	63
Constructional design		Electromechanical axis with toothed belt and internal roller guide		
Guide		Internal roller guide		
Mounting position		Any		
Max. working stroke <sup>1)</sup>	[mm]	1 ... 5000	1 ... 5000	1 ... 5000 <sup>2)</sup>
Max. working load	[kg]	15	30	60
Max. feed force $F_x$	[N]	260	610	1500
Max. radial force <sup>3)</sup>	[N]	260	935	2490
Radial force <sup>4)</sup>	[N]	110	100	1050
Max. driving torque	[Nm]	3.7	12.1	55.38
Max. no-load torque	[Nm]	0.5	1.0	4.5
Max. speed	[m/s]	10		
Max. acceleration	[m/s <sup>2</sup> ]	50	50	50
Repetition accuracy	[mm]	±0.1		

- 1) Total stroke = working stroke + 2x stroke reserve
- 2) In the case of the variant with extended slide (-GV), the maximum working stroke is 4,800 mm
- 3) On the drive shaft
- 4) On the drive shaft, with a service life of 10,000 km

Operating and environmental conditions				
Size		25	40	63
Ambient temperature	[°C]	0 ... +60		
Protection class		IP40		

Weights [kg]						
Size	25		40		63	
	GK	GV	GK	GV	GK	GV
Basic weight with 0 mm stroke	2.61	3.15	7.75	9.32	29.81	34.91
Additional weight per 100 mm stroke	0.30		0.61		1.44	
Moving load	0,62	0,85	2,00	2,70	5,20	7,00

Mass moment of inertia							
Size	25		40		63		
	GK	GV	GK	GV	GK	GV	
$J_0$	[kg cm <sup>2</sup> ]	1.75	2.75	9.89	15.37	108.11	156.71
$J_H$ per metre stroke	[kg cm <sup>2</sup> /m]	0.188		0.933		7.605	
$J_L$ per kg working load	[kg cm <sup>2</sup> /kg]	2.052		3.958		13.634	

The mass moment of inertia  $J_A$  of the entire axis is calculated as follows:

$$J_A = J_0 + J_H \times \text{working stroke [m]} + J_L \times m_{\text{working load [kg]}}$$



# Toothed belt axes DGE-ZR-RF, with roller guide

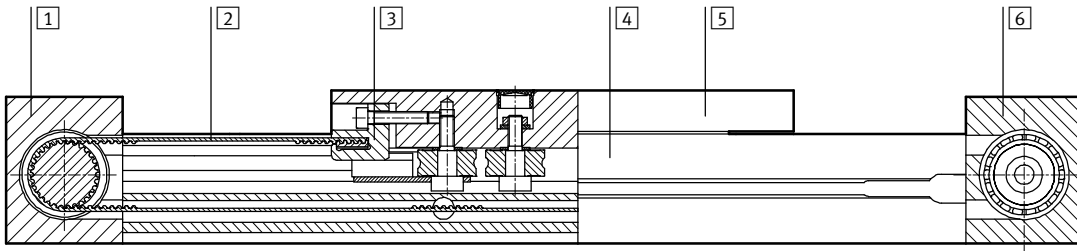
Technical data

Toothed belt				
Size		25	40	63
Tensile stress <sup>1)</sup>	[%]	0.16	0.11	0.15
Pitch	[mm]	3	5	8
Effective diameter	[mm]	28.65	39.79	73.85
Feed constant	[mm]	90	125	232

1) At max. feed force

## Materials

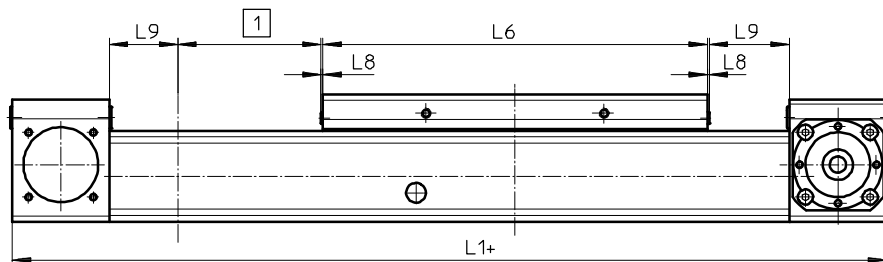
Sectional view



Axis		
1	Return pulley housing	Anodised aluminium
2	Toothed belt	Polychloroprene with Glascord and nylon coating
3	Clamping component	Special steel casting
4	Profile	Anodised aluminium
5	Slide	Anodised aluminium
6	Drive housing	Anodised aluminium

## Stroke reserve

- L9 Stroke reserve:  
Safety distance to mechanical stop, present at both ends of the axis in addition to the stroke.
- L6 Slide length
- L8 Stop element
- L1+ Overall length of axis
- 1 Working stroke



Example:

Type DGE-25-500-ZR-RF

Working stroke = 500 mm

Stroke reserve = (2x 63 mm)

= 126 mm

Total stroke = 500 mm + 126 mm

= 626 mm

Stroke reserve L9 [mm] per end position			
Size	25	40	63
Standard slide GK	63	100	172
Extended slide GV	63	100	172

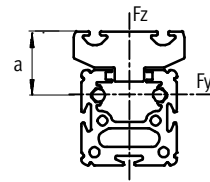
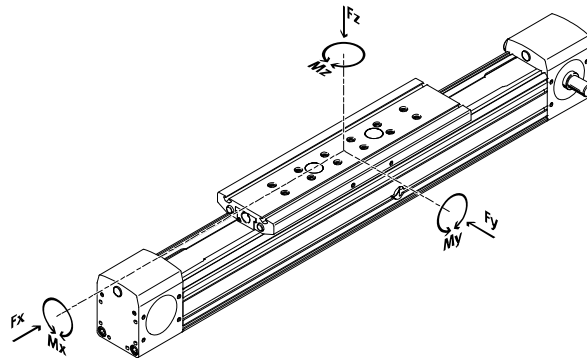
# Toothed belt axes DGE-ZR-RF, with roller guide

Technical data



## Characteristic load values

The indicated forces and torques refer to the centre of the guide. They must not be exceeded in the dynamic range. Special attention must be paid to the cushioning phase.



Distance a with:  
 DGE-25: 30 mm  
 DGE-40: 37 mm  
 DGE-63: 44.6 mm

If the drive is subjected to more than two of the indicated forces and torques simultaneously, the following equations must be satisfied in addition to the indicated maximum loads.

Calculating the load comparison factor:

$$f_v = \frac{|F_y|}{F_{y_{max}}} + \frac{|F_z|}{F_{z_{max}}} + \frac{|M_x|}{M_{x_{max}}} + \frac{|M_y|}{M_{y_{max}}} + \frac{|M_z|}{M_{z_{max}}} \leq 1$$

## Permissible forces and torques

Size	25		40		63	
	GK	GV	GK	GV	GK	GV
F <sub>xmax.</sub> [N]	260		610		1500	
F <sub>ymax.</sub> [N]	150		300		600	
F <sub>zmax.</sub> [N]	150		300		600	
M <sub>xmax.</sub> [Nm]	7		18		65	
M <sub>ymax.</sub> [Nm]	15	30	60	120	170	340
M <sub>zmax.</sub> [Nm]	15	30	90	180	300	600

## Service life

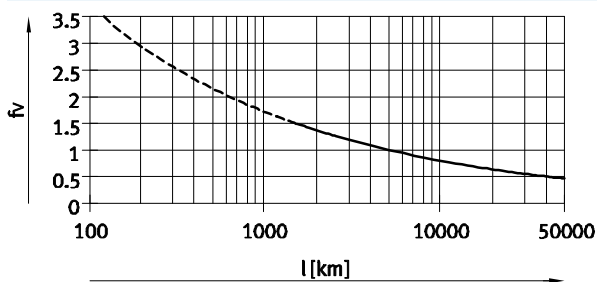
The service life of the guide depends on the load. To provide a rough indication of the service life of the guide, the

graph below plots the load comparison factor  $f_c$  against the service life.

This graph only shows theoretical values. Consultation with your local contact person at Festo is mandatory

for load comparison factors  $f_c$  greater than 1.5.

### Load comparison factor $f_c$ as a function of service life



Example:

A user wants to move an X kg load. Using the above calculation gives a value of 1.5 for the load comparison factor  $f_c$ . According to the graph, the guide would have a service life of

approx. 1,500 km. Reducing the acceleration reduces the M<sub>z</sub> and M<sub>y</sub> values. A load comparison factor of 1 now gives a service life of 5,000 km.

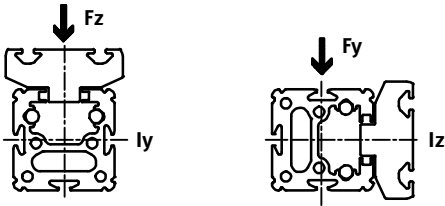
- - Note

Sizing software  
 PositioningDrives  
[www.festo.com](http://www.festo.com)

# Toothed belt axes DGE-ZR-RF, with roller guide

Technical data

## 2nd moment of area



Size		25	40	63
ly	[mm <sup>4</sup> ]	1.88x10 <sup>5</sup>	7.03x10 <sup>5</sup>	4.75x10 <sup>6</sup>
lz	[mm <sup>4</sup> ]	2.36x10 <sup>5</sup>	9.463x10 <sup>5</sup>	5.997x10 <sup>6</sup>

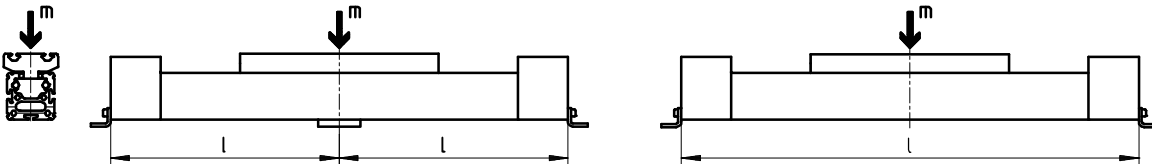
## Maximum permissible support span l as a function of the applied load m

The axis may need to be supported with central supports MUP in order to restrict deflection with long stroke lengths. The following diagrams serve

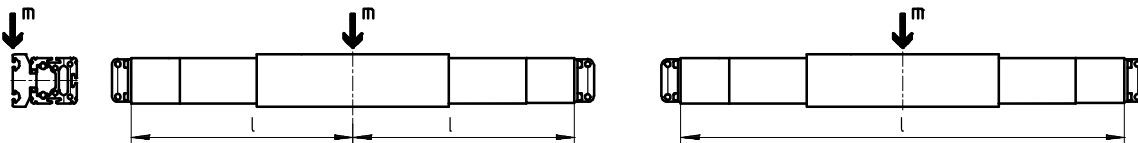
to determine the maximum permissible support span as a function of the applied load acting upon the axis.

A distinction is made here between forces acting upon the surface of the slide and forces acting upon the front of the slide.

### 1 Load on the surface of the slide

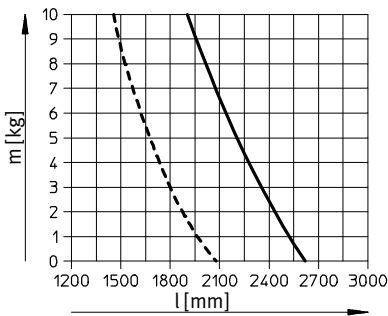


### 2 Load on the front of the slide

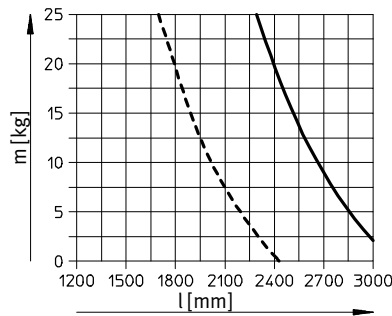


## Maximum support span l (without central support) as a function of the applied load m

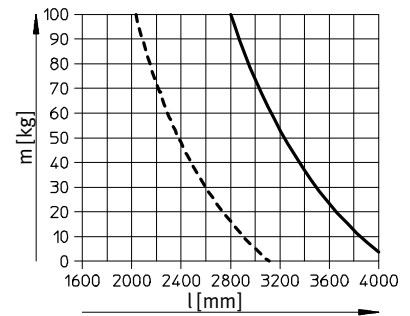
DGE-25-RF



DGE-40-RF



DGE-63-RF



- 1
- - - 2

# Toothed belt axes DGE-ZR-RF, with roller guide

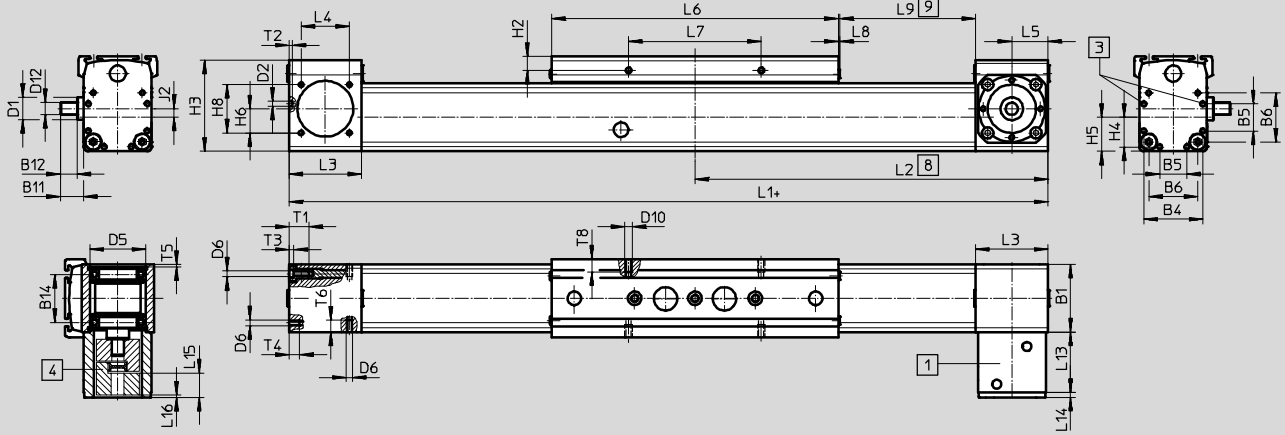
Technical data

FESTO

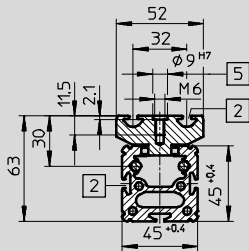
## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

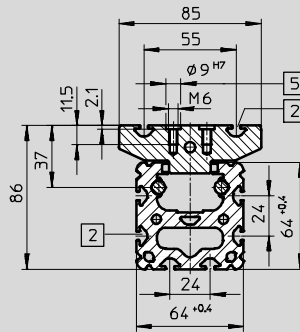
### DGE-25/-40/-63



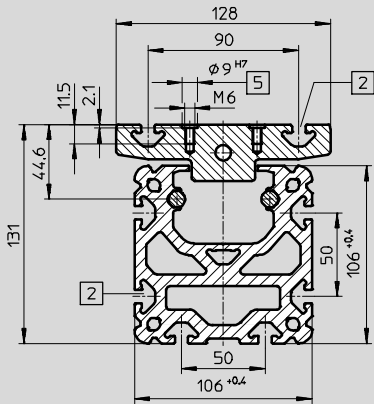
### DGE-25



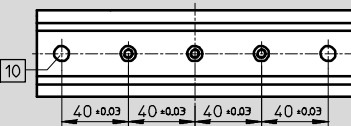
### DGE-40



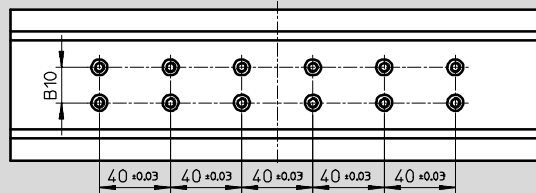
### DGE-63



### DGE-25-GK



### DGE-40-GK



- |                                   |  |   |                                   |
|-----------------------------------|--|---|-----------------------------------|
| 1 Coupling housing                | 4 Coupling   | 8 Driver in end position of working stroke (stroke reserve up to mechanical stop still present) | 9 Stroke reserve → 49             |
| 2 Slot for slot nuts              | 5 Hole for centring sleeve ZBH-9 and mounting thread |   | 10 Hole for centring sleeve ZBH-9 |
| 3 Centring hole for foot mounting |  |   | + = plus stroke length            |

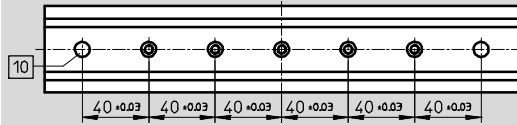
# Toothed belt axes DGE-ZR-RF, with roller guide

Technical data

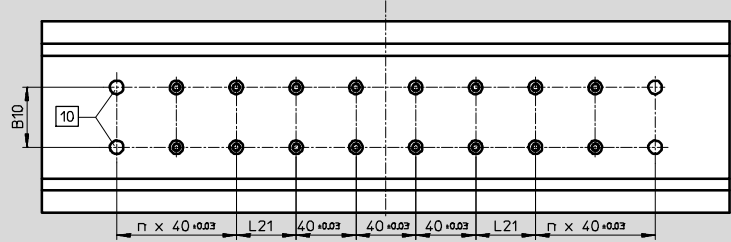
## Dimensions

Download CAD data → [www.festo.com](http://www.festo.com)

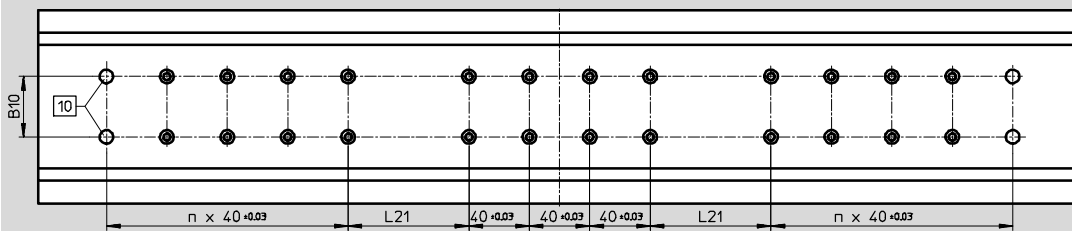
### DGE-25-GV



### DGE-40-GV, DGE-63-GK



### DGE-63-GV



10 Hole for centring sleeve ZBH-9

Size	B1	B4	B5	B6	B10 ±0.03	B11	B12	B14	D1 ∅	D2	D5 H7	D6	D10	D12 ∅ h6	
25	GK GV	45	39.1	18	32.5	-	15.6	11	31.8	15	3.3 <sub>+0.1</sub>	37	M4	M5	8
40	GK GV	64	53	28	49	20	29.6	24.5	45.5	20	4.4 <sub>H13</sub>	47	M5	M5	15
63	GK GV	106	89	44	83	40	41.1	35.2	74.3	35	6.4 <sub>+0.1</sub>	80	M8	M8	25

Size	H2	H3	H4	H5	H6	H8	J2	L1	L2	L3	L4	L5	L6	L7	
25	GK GV	9.3	60.4	19.6	22.5	16	32	5.8	414 509	207 254.5	48	32	24	190 285	88
40	GK GV	9.5	83.8	26.5	32	19.5	30	8.8	638 778	319 389	67	54	34	300 440	58
63	GK GV	10.5	129.3	44.5	52.8	27.5	49	10.1	1020 1250	510 625	106	84	55	460 690	72

Size	L8	L9	L13	L14	L15	L16	L21 ±0.03	n	T1	T2	T3	T4	T5	T6	T8	
25	GK GV	1	63	40	3,2	14,6	3,6	-	-	13	2	3	7	< 1.6	8	8.5
40	GK GV	2	100	65	4	22,8	-2,2	40	- 2	13.2	3	5	12	< 2.9	12	8.5
63	GK GV	2	172	91	5	35	0	40 80	2 4	21.2	4	6.5	22	< 5.1	15	12

# Toothed belt axes DGE-ZR-RF, with roller guide

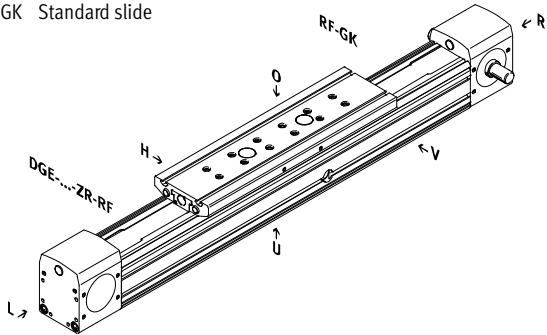
Ordering data – Modular products



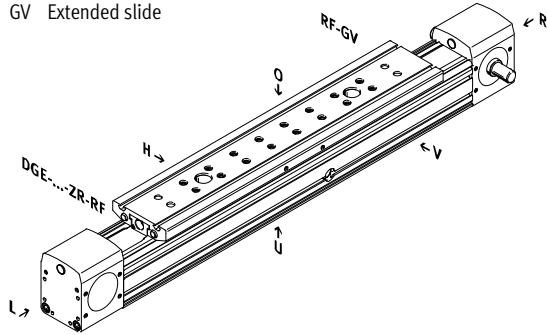
## Order code

Mandatory data

GK Standard slide

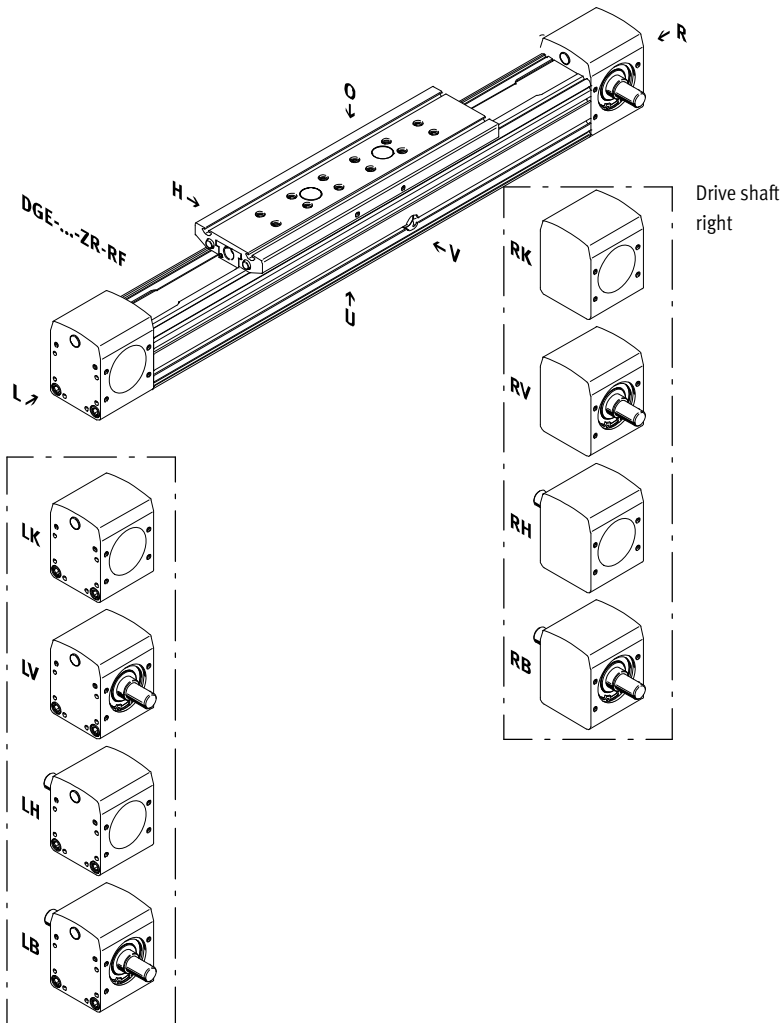


GV Extended slide



## Drive shaft

- LK No drive shaft on left
- LV Drive shaft on left, front
- LH Drive shaft on left, rear
- LB Drive shaft on left, front and rear
- RK No drive shaft on right
- RV Drive shaft on right, front
- RH Drive shaft on right, rear
- RB Drive shaft on right, front and rear



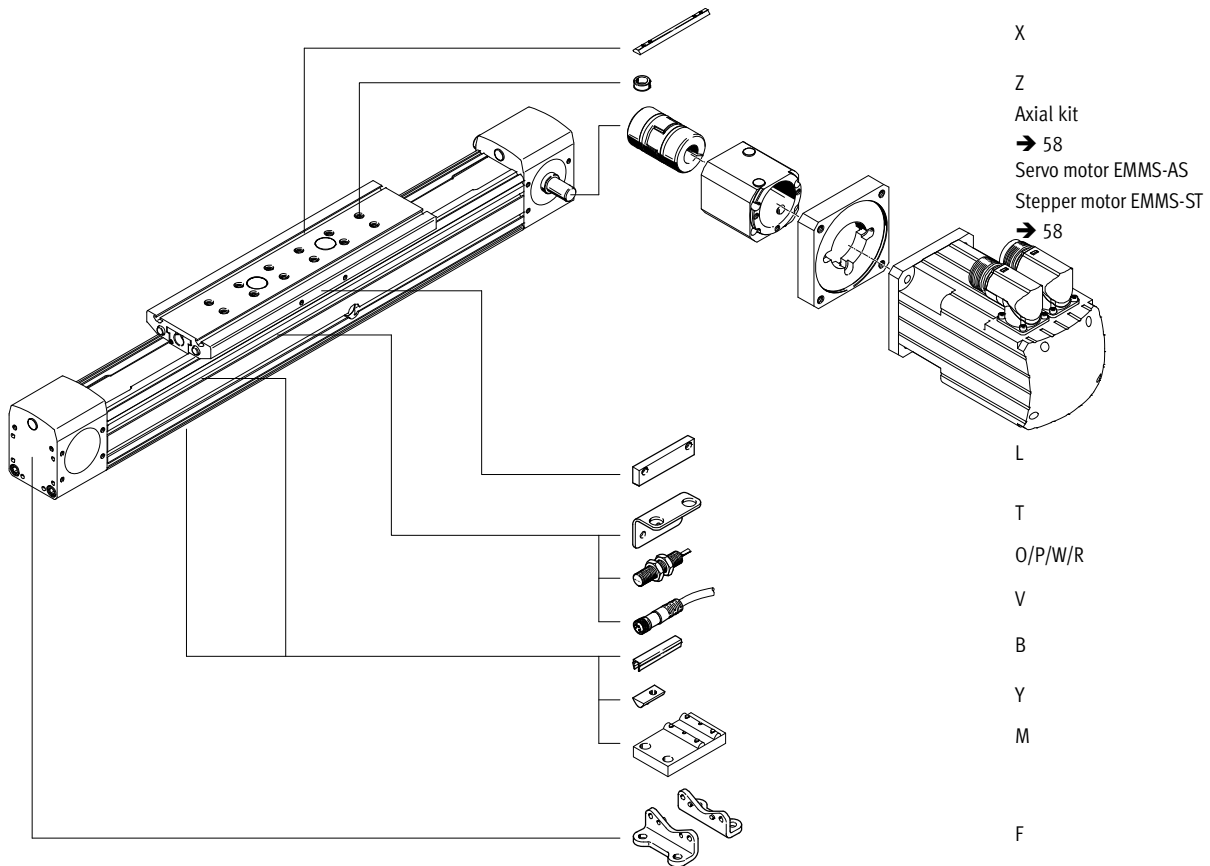
- O top
- U underneath
- R right
- L left
- V front
- H rear

# Toothed belt axes DGE-ZR-RF, with roller guide

Ordering data – Modular products

**Order code**

Options



# Toothed belt axes DGE-ZR-RF, with roller guide

Ordering data – Modular products

**M** Mandatory data →

Module No.	Design	Size	Stroke	Drive function	Guide	Drive shaft on left	Drive shaft on right	Slide
534391	DGE	25	1 ... 5 000	ZR	RF	LK	RK	GK
534392		40				RV	GV	
534393		63				LH LB	RH RB	
<b>Ordering example</b>								
<b>534391</b>	<b>DGE</b>	<b>25</b>	<b>600</b>	<b>ZR</b>	<b>RF</b>	<b>LK</b>	<b>RV</b>	<b>GK</b>

**Ordering table**

Size	25	40	63	Condi- tions	Code	Enter code
<b>M</b> Module No.	<b>534391</b>	<b>534392</b>	<b>534393</b>			
Design	Electromechanical linear drive				<b>DGE</b>	DGE
Size	25	40	63		-...	
Stroke [mm]	1 ... 5000	1 ... 5000	1 ... 5000		-...	
Drive function	Electromechanical drive with toothed belt				<b>-ZR</b>	-ZR
Guide	Roller guide				<b>-RF</b>	-RF
Drive shaft on left	No drive shaft on left			[1]	<b>-LK</b>	
	Drive shaft on left, front				<b>-LV</b>	
	Drive shaft on left, rear				<b>-LH</b>	
	Drive shaft on left, front and rear				<b>-LB</b>	
Drive shaft on right	No drive shaft on right			[2]	<b>-RK</b>	
	Drive shaft on right, front				<b>-RV</b>	
	Drive shaft on right, rear				<b>-RH</b>	
	Drive shaft on right, front and rear				<b>-RB</b>	
Slide	Standard slide				<b>-GK</b>	
	Extended slide			[3]	<b>-GV</b>	

- [1] **LK** Not with drive shaft on right RK.
- [2] **RK** Not with drive shaft on left LK.

- [3] **GV** Maximum stroke: Size 63: 4800 mm

Transfer order code

**DGE** -  -  - **ZR** - **RF** -  -  -



# Toothed belt axes DGE-ZR-RF, with roller guide

Ordering data – Modular products

Options									
Accessories	Slot cover		Central support		Centring pins/sleeves		Sensor bracket		Inductive sensor
ZUB	Slot nut		Foot mounting		Plug socket		Switching lug		
	...B	...Y ...X	...M	...F	...Z	...V	...T	L	...O ...P ...W ...R
ZUB	-	2X					2T		20 2P

Ordering table							
Size	25	40	63	Condi- tions	Code	Enter code	
0	Accessories			Supplied separately		ZUB-	ZUB-
	Slot cover for mounting slot			1 ... 10		...B	
	Slot nut for profile slot			1 ... 10		...Y	
	Slot nut for slide			1 ... 10		...X	
	Central support			1 ... 10		...M	
	Foot mounting (kit)			1 ... 10		...F	
	Centring sleeve (pack of 10)			10, 20, 30, 40, 50, 60, 70, 80, 90		...Z	
	Cable with socket, 2.5 m			1 ... 10		...V	
	Sensor bracket for inductive sensors			1 ... 5		...T	
	Switching lug			1		L	
	Inductive proximity sensor	NO contact with cable		1 ... 5		...O	
		NC contact with cable		1 ... 5		...P	
		NO contact with plug		1 ... 5		...W	
		NC contact with plug		1 ... 5		...R	

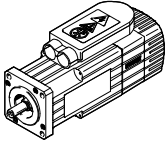
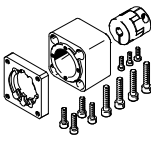


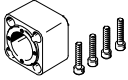
Transfer order code

ZUB - [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

# Toothed belt axes DGE

Accessories

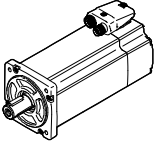
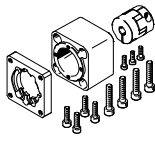


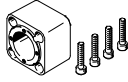
FESTO

Permissible axis/motor combinations with axial kit – Without gear unit					Technical data → Internet: eamm-a
Motor	Axial kit	Axial kit consisting of:			
		Motor flange	Coupling	Coupling housing	
					
Type	Part No. Type	Part No. Type	Part No. Type	Part No. Type	
<b>DGE-8-...-ZR</b>					
With servo motor					
EMMS-AS-40-...	550921 EAMM-A-G13-40A	540301 EAMF-A-28A/30A-40A	540750 EAMC-B-15-22-4-6	171186 EAMK-A-G13-28A	
With stepper motor					
EMMS-ST-42-...	550922 EAMM-A-G13-42A	530080 EAMF-A-28A-42A	530084 EAMC-B-15-22-4-5	171186 EAMK-A-G13-28A	
<b>DGE-12-...-ZR</b>					
With servo motor					
EMMS-AS-40-...	550923 EAMM-A-G16-40A	540301 EAMF-A-28A/30A-40A	540750 EAMC-B-15-22-4-6	171185 EAMK-A-G16-30A	
EMMS-AS-55-...	550925 EAMM-A-G16-55A	534807 EAMF-A-30A-55A	184262 EAMC-B-15-22-4-9	171185 EAMK-A-G16-30A	
With stepper motor					
EMMS-ST-42-...	550924 EAMM-A-G16-42A	530079 EAMF-A-30A-42A	530084 EAMC-B-15-22-4-5	171185 EAMK-A-G16-30A	
<b>DGE-18-...-ZR</b>					
With servo motor					
EMMS-AS-40-...	550926 EAMM-A-G19-40A	550985 EAMF-A-44A/B-40A	184265 EAMC-B-19-24-6-6	170375 EAMK-A-G19-44B	
EMMS-AS-55-...	550927 EAMM-A-G19-55A	529942 EAMF-A-44A/B-55A	184263 EAMC-B-19-24-6-9	170375 EAMK-A-G19-44B	
With stepper motor					
EMMS-ST-57-...	550928 EAMM-A-G19-57A	530081 EAMF-A-44A/B-57A	530086 EAMC-B-19-24-6-6.35	170375 EAMK-A-G19-44B	
With integrated drive					
EMCA-EC-67-...	1454260 EAMM-A-G19-67A	1476305 EAMF-A-44A/B/C-67A-S1	184263 EAMC-B-19-24-6-9	170375 EAMK-A-G19-44B	
<b>DGE-25-...-ZR</b>					
With servo motor					
EMMS-AS-55-...	550929 EAMM-A-F30-55A	529942 EAMF-A-44A/B-55A	557390 EAMC-30-35-8-9	124628 EAMK-A-F30-44A	
EMMS-AS-70-...	550932 EAMM-A-F30-70A	529943 EAMF-A-44A/B-70A	123042 EAMC-30-35-8-11	124628 EAMK-A-F30-44A	
With stepper motor					
EMMS-ST-57-...	550930 EAMM-A-F30-57A	530081 EAMF-A-44A/B-57A	530088 EAMC-30-35-6.35-8	124628 EAMK-A-F30-44A	
EMMS-ST-87-...	550933 EAMM-A-F30-87A	530082 EAMF-A-44A/B-87A	123042 EAMC-30-35-8-11	124628 EAMK-A-F30-44A	

# Toothed belt axes DGE

Accessories

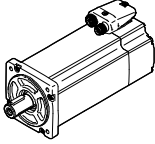
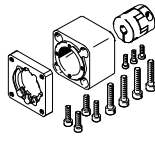


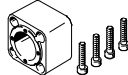
FESTO

Permissible axis/motor combinations with axial kit – Without gear unit					Technical data → Internet: eamm-a
Motor	Axial kit	Axial kit consisting of:			
		Motor flange	Coupling	Coupling housing	
					
Type	Part No. Type	Part No. Type	Part No. Type	Part No. Type	
<b>DGE-25-...-ZR-RF</b>					
With servo motor					
EMMS-AS-55-...	550942 EAMM-A-F37-55A	529942 EAMF-A-44A/B-55A	557390 EAMC-30-35-8-9	534394 EAMK-A-F37-44A/C	
EMMS-AS-70-...	550945 EAMM-A-F37-70A	529943 EAMF-A-44A/B-70A	123042 EAMC-30-35-8-11	534394 EAMK-A-F37-44A/C	
With stepper motor					
EMMS-ST-57-...	550943 EAMM-A-F37-57A	530081 EAMF-A-44A/B-57A	530088 EAMC-30-35-6.35-8	534394 EAMK-A-F37-44A/C	
EMMS-ST-87-...	550946 EAMM-A-F37-87A	530082 EAMF-A-44A/B-87A	123042 EAMC-30-35-8-11	534394 EAMK-A-F37-44A/C	
<b>DGE-40-...-ZR</b>					
With servo motor					
EMMS-AS-70-...	550934 EAMM-A-F40-70A	529945 EAMF-A-64A/B-70A	550998 EAMC-40-66-11-15	124629 EAMK-A-F40-64A	
EMME-AS-100-...	550937 EAMM-A-F40-100A	529947 EAMF-A-64A/C/D-100A	123844 EAMC-40-66-15-19	124629 EAMK-A-F40-64A	
EMMS-AS-100-...	550937 EAMM-A-F40-100A	529947 EAMF-A-64A/C/D-100A	123844 EAMC-40-66-15-19	124629 EAMK-A-F40-64A	
With stepper motor					
EMMS-ST-87-...	550936 EAMM-A-F40-87A	533140 EAMF-A-64A/B-87A	550998 EAMC-40-66-11-15	124629 EAMK-A-F40-64A	
<b>DGE-40-...-ZR-RF</b>					
With servo motor					
EMME-AS-100-...	550949 EAMM-A-F47-100A	529947 EAMF-A-64A/C/D-100A	123844 EAMC-40-66-15-19	534395 EAMK-A-F47-64A	
EMMS-AS-100-...	550949 EAMM-A-F47-100A	529947 EAMF-A-64A/C/D-100A	123844 EAMC-40-66-15-19	534395 EAMK-A-F47-64A	
EMMS-AS-140-...	550950 EAMM-A-F47-140A	550988 EAMF-A-64A-140A	176033 EAMC-40-66-15-24	534395 EAMK-A-F47-64A	
With stepper motor					
EMMS-ST-87-...	550948 EAMM-A-F47-87A	533140 EAMF-A-64A/B-87A	550998 EAMC-40-66-11-15	534395 EAMK-A-F47-64A	

# Toothed belt axes DGE

Accessories

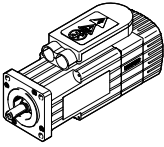
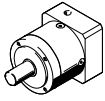
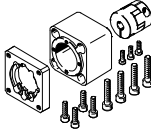


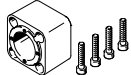
FESTO

Permissible axis/motor combinations with axial kit – Without gear unit					Technical data → Internet: eamm-a
Motor	Axial kit	Axial kit consisting of:			
		Motor flange	Coupling	Coupling housing	
					
Type	Part No. Type	Part No. Type	Part No. Type	Part No. Type	
<b>DGE-63-...-ZR</b>					
With servo motor					
<b>EMME-AS-100-...</b>	550939 EAMM-A-F62-100A	529949 EAMF-A-118C-100A	551000 EAMC-65-90-19-25	124630 EAMK-A-F62-118A/B/C	
<b>EMMS-AS-100-...</b>	550939 EAMM-A-F62-100A	529949 EAMF-A-118C-100A	551000 EAMC-65-90-19-25	124630 EAMK-A-F62-118A/B/C	
<b>EMMS-AS-140-...</b>	550941 EAMM-A-F62-140A	550991 EAMF-A-118B-140A	123852 EAMC-65-90-24-25	124630 EAMK-A-F62-118A/B/C	
<b>DGE-63-...-ZR-RF</b>					
With servo motor					
<b>EMME-AS-100-...</b>	550952 EAMM-A-F80-100A	529949 EAMF-A-118C-100A	551000 EAMC-65-90-19-25	534396 EAMK-A-F80-118A/B/C	
<b>EMMS-AS-100-...</b>	550952 EAMM-A-F80-100A	529949 EAMF-A-118C-100A	551000 EAMC-65-90-19-25	534396 EAMK-A-F80-118A/B/C	
<b>EMMS-AS-140-...</b>	550954 EAMM-A-F80-140A	550991 EAMF-A-118B-140A	123852 EAMC-65-90-24-25	534396 EAMK-A-F80-118A/B/C	

# Toothed belt axes DGE

Accessories

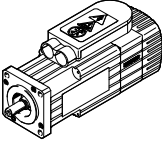
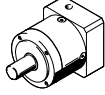
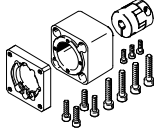


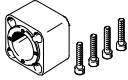
FESTO

Permissible axis/motor combinations with axial kit – With gear unit					Technical data → Internet: eamm-a
Motor	Gear unit	Axial kit	Axial kit consisting of:		
			Motor flange	Coupling	Coupling housing
					
Type	Type	Part No. Type	Part No. Type	Part No. Type	Part No. Type
<b>DGE-18-...-ZR</b>					
With servo motor					
EMME-AS-40-...	EMGA-40-P-G...-EAS-40	1454259 EAMM-A-G19-40G	550986 EAMF-A-44A/B-40G	1450210 EAMC-B-19-24-6-10	170375 EAMK-A-G19-44B
EMMS-AS-40-...	EMGA-40-P-G...-SAS-40	1454259 EAMM-A-G19-40G	550986 EAMF-A-44A/B-40G	1450210 EAMC-B-19-24-6-10	170375 EAMK-A-G19-44B
With stepper motor					
EMMS-ST-42-...	EMGA-40-P-G...-SST-42	1454259 EAMM-A-G19-40G	550986 EAMF-A-44A/B-40G	1450210 EAMC-B-19-24-6-10	170375 EAMK-A-G19-44B
With integrated drive					
EMCA-EC-67-...	EMGC-40-...	1454259 EAMM-A-G19-40G	550986 EAMF-A-44A/B-40G	1450210 EAMC-B-19-24-6-10	170375 EAMK-A-G19-44B
<b>DGE-25-...-ZR</b>					
With servo motor					
EMME-AS-40-...	EMGA-40-P-G...-EAS-40	1454254 EAMM-A-F30-40G	550986 EAMF-A-44A/B-40G	123050 EAMC-30-35-8-10	124628 EAMK-A-F30-44A
EMMS-AS-40-...	EMGA-40-P-G...-SAS-40	1454254 EAMM-A-F30-40G	550986 EAMF-A-44A/B-40G	123050 EAMC-30-35-8-10	124628 EAMK-A-F30-44A
EMMS-AS-55-...	EMGA-60-P-G...-SAS-55	550931 EAMM-A-F30-60G	529944 EAMF-A-44A/B-60G	123042 EAMC-30-35-8-11	124628 EAMK-A-F30-44A
EMME-AS-60-...	EMGA-60-P-G...-EAS-60	1454255 EAMM-A-F30-60H	1780430 EAMF-A-44A-60G/H	1453063 EAMC-30-35-8-14	124628 EAMK-A-F30-44A
EMMS-AS-70-...	EMGA-60-P-G...-SAS-70	550931 EAMM-A-F30-60G	529944 EAMF-A-44A/B-60G	123042 EAMC-30-35-8-11	124628 EAMK-A-F30-44A
With stepper motor					
EMMS-ST-42-...	EMGA-40-P-G...-SST-42	1454254 EAMM-A-F30-40G	550986 EAMF-A-44A/B-40G	123050 EAMC-30-35-8-10	124628 EAMK-A-F30-44A
EMMS-ST-57-...	EMGA-60-P-G...-SST-57	550931 EAMM-A-F30-60G	529944 EAMF-A-44A/B-60G	123042 EAMC-30-35-8-11	124628 EAMK-A-F30-44A
With integrated drive					
EMCA-EC-67-...	EMGC-40-...	1454254 EAMM-A-F30-40G	550986 EAMF-A-44A/B-40G	123050 EAMC-30-35-8-10	124628 EAMK-A-F30-44A
EMCA-EC-67-...	EMGC-60-...	1454255 EAMM-A-F30-60H	1780430 EAMF-A-44A/60G/H	1453063 EAMC-30-35-8-14	124628 EAMK-A-F30-44A

# Toothed belt axes DGE

Accessories

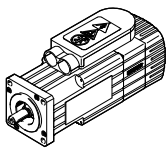
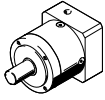
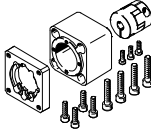


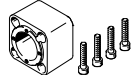
FESTO

Permissible axis/motor combinations with axial kit – With gear unit						Technical data → Internet: eamm-a
Motor	Gear unit	Axial kit	Axial kit consisting of:			
			Motor flange	Coupling	Coupling housing	
						
Type	Type	Part No. Type	Part No. Type	Part No. Type	Part No. Type	
<b>DGE-25-...-ZR-RF</b>						
With servo motor						
EMME-AS-40-...	EMGA-40-P-G...-EAS-40	1454257 EAMM-A-F37-40G	550986 EAMF-A-44A/B-40G	123050 EAMC-30-35-8-10	534394 EAMK-A-F37-44A/C	
EMMS-AS-40-...	EMGA-40-P-G...-SAS-40	1454257 EAMM-A-F37-40G	550986 EAMF-A-44A/B-40G	123050 EAMC-30-35-8-10	534394 EAMK-A-F37-44A/C	
EMMS-AS-55-...	EMGA-60-P-G...-SAS-55	550944 EAMM-A-F37-60G	529944 EAMF-A-44A/B-60G	123042 EAMC-30-35-8-11	534394 EAMK-A-F37-44A/C	
EMME-AS-60-...	EMGA-60-P-G...-EAS-60	1454258 EAMM-A-F37-60H	1780430 EAMF-A-44A/60G/H	1453063 EAMC-30-35-8-14	534394 EAMK-A-F37-44A/C	
EMMS-AS-70-...	EMGA-60-P-G...-SAS-70	550944 EAMM-A-F37-60G	529944 EAMF-A-44A/B-60G	123042 EAMC-30-35-8-11	534394 EAMK-A-F37-44A/C	
With stepper motor						
EMMS-ST-42-...	EMGA-40-P-G...-SST-42	1454257 EAMM-A-F37-40G	550986 EAMF-A-44A/B-40G	123050 EAMC-30-35-8-10	534394 EAMK-A-F37-44A/C	
EMMS-ST-57-...	EMGA-60-P-G...-SST-57	550944 EAMM-A-F37-60G	529944 EAMF-A-44A/B-60G	123042 EAMC-30-35-8-11	534394 EAMK-A-F37-44A/C	
With integrated drive						
EMCA-EC-67-...	EMGC-40-...	1454257 EAMM-A-F37-40G	550986 EAMF-A-44A/B-40G	123050 EAMC-30-35-8-10	534394 EAMK-A-F37-44A/C	
EMCA-EC-67-...	EMGC-60-...	1454258 EAMM-A-F37-60H	1780430 EAMF-A-44A/60G/H	1453063 EAMC-30-35-8-14	534394 EAMK-A-F37-44A/C	
<b>DGE-40-...-ZR</b>						
With servo motor						
EMMS-AS-70-...	EMGA-80-P-G...-SAS-70	550935 EAMM-A-F40-80G	533139 EAMF-A-64A/C-80G	123845 EAMC-40-66-15-20	124629 EAMK-A-F40-64A	
EMME-AS-80-...	EMGA-80-P-G...-EAS-80	550935 EAMM-A-F40-80G	533139 EAMF-A-64A/C-80G	123845 EAMC-40-66-15-20	124629 124629-A-F40-64A	
EMMS-AS-100-...	EMGA-80-P-G...-SAS-100	550935 EAMM-A-F40-80G	533139 EAMF-A-64A/C-80G	123845 EAMC-40-66-15-20	124629 EAMK-A-F40-64A	
With stepper motor						
EMMS-ST-87-...	EMGA-80-P-G...-SST-87	550935 EAMM-A-F40-80G	533139 EAMF-A-64A/C-80G	123845 EAMC-40-66-15-20	124629 EAMK-A-F40-64A	
<b>DGE-40-...-ZR-RF</b>						
With servo motor						
EMMS-AS-70-...	EMGA-80-P-G...-SAS-70	550947 EAMM-A-F47-80G	533139 EAMF-A-64A/C-80G	123845 EAMC-40-66-15-20	534395 EAMK-A-F47-64A	
EMME-AS-80-...	EMGA-80-P-G...-EAS-80	550947 EAMM-A-F47-80G	533139 EAMF-A-64A/C-80G	123845 EAMC-40-66-15-20	534395 EAMK-A-F47-64A	
EMMS-AS-100-...	EMGA-80-P-G...-SAS-100	550947 EAMM-A-F47-80G	533139 EAMF-A-64A/C-80G	123845 EAMC-40-66-15-20	534395 EAMK-A-F47-64A	
With stepper motor						
EMMS-ST-87-...	EMGA-80-P-G...-SST-87	550947 EAMM-A-F47-80G	533139 EAMF-A-64A/C-80G	123845 EAMC-40-66-15-20	534395 EAMK-A-F47-64A	

# Toothed belt axes DGE

Accessories



Permissible axis/motor combinations with axial kit – With gear unit						Technical data → Internet: eamm-a
Motor	Gear unit	Axial kit	Axial kit consisting of:			
			Motor flange	Coupling	Coupling housing	
						
Type	Type	Part No. Type	Part No. Type	Part No. Type	Part No. Type	
<b>DGE-63-...-ZR</b>						
With servo motor						
EMMS-AS-70-...	EMGA-80-P-G...-SAS-70	550938 EAMM-A-F62-80G	550989 EAMF-A-118A-80G	176035 EAMC-65-90-20-25	124630 EAMK-A-F62-118A/B/C	
EMME-AS-80-...	EMGA-80-P-G...-EAS-80	550938 EAMM-A-F62-80G	550989 EAMF-A-118A-80G	176035 EAMC-65-90-20-25	124630 EAMK-A-F62-118A/B/C	
EMMS-AS-100-...	EMGA-80-P-G...-SAS-100	550938 EAMM-A-F62-80G	550989 EAMF-A-118A-80G	176035 EAMC-65-90-20-25	124630 EAMK-A-F62-118A/B/C	
EMMS-AS-100-...	EMGA-120-P-G...-SAS-100	550940 EAMM-A-F62-120G	550990 EAMF-A-118A-120G	123853 EAMC-65-90-25-25	124630 EAMK-A-F62-118A/B/C	
EMMS-AS-140-...	EMGA-120-P-G...-SAS-140	550940 EAMM-A-F62-120G	550990 EAMF-A-118A-120G	123853 EAMC-65-90-25-25	124630 EAMK-A-F62-118A/B/C	
With stepper motor						
EMMS-ST-87-...	EMGA-80-P-G...-SST-87	550938 EAMM-A-F62-80G	550989 EAMF-A-118A-80G	176035 EAMC-65-90-20-25	124630 EAMK-A-F62-118A/B/C	
<b>DGE-63-...-ZR-RF</b>						
With servo motor						
EMMS-AS-70-...	EMGA-80-P-G...-SAS-70	550951 EAMM-A-F80-80G	550989 EAMF-A-118A-80G	176035 EAMC-65-90-20-25	534396 EAMK-A-F80-118A/B/C	
EMME-AS-80-...	EMGA-80-P-G...-EAS-80	550951 EAMM-A-F80-80G	550989 EAMF-A-118A-80G	176035 EAMC-65-90-20-25	534396 EAMK-A-F80-118A/B/C	
EMMS-AS-100-...	EMGA-80-P-G...-SAS-100	550951 EAMM-A-F80-80G	550989 EAMF-A-118A-80G	176035 EAMC-65-90-20-25	534396 EAMK-A-F80-118A/B/C	
EMMS-AS-100-...	EMGA-120-P-G...-SAS-100	550953 EAMM-A-F80-120G	550990 EAMF-A-118A-120G	123853 EAMC-65-90-25-25	534396 EAMK-A-F80-118A/B/C	
EMMS-AS-140-...	EMGA-120-P-G...-SAS-140	550953 EAMM-A-F80-120G	550990 EAMF-A-118A-120G	123853 EAMC-65-90-25-25	534396 EAMK-A-F80-118A/B/C	
EMMS-AS-140-...	EMGA-160-P-G...-SAS-140	550955 EAMM-A-F80-160G	550992 EAMF-A-118A-160G	551001 EAMC-65-90-25-40	534396 EAMK-A-F80-118A/B/C	
With stepper motor						
EMMS-ST-87-...	EMGA-80-P-G...-SST-87	550951 EAMM-A-F80-80G	550989 EAMF-A-118A-80G	176035 EAMC-65-90-20-25	534396 EAMK-A-F80-118A/B/C	

# Toothed belt axes DGE

Accessories

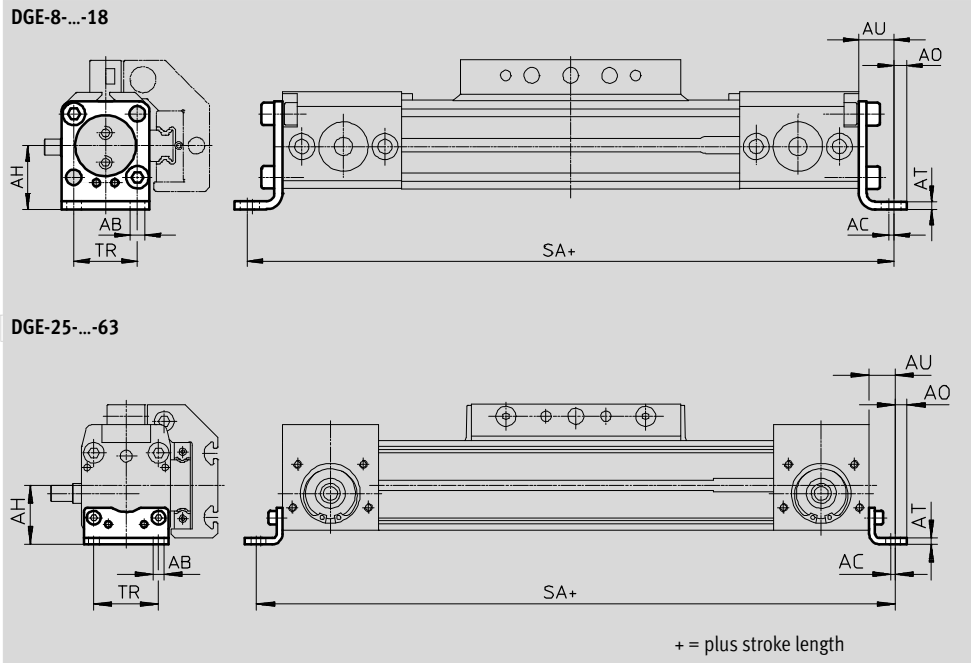


**Foot mounting HP**  
(order code F)

Material:  
Galvanised steel  
Free of copper, PTFE and silicone



HP-25



### Dimensions and ordering data

For size	AB ∅	AC	AH	AO	AT	AU	TR
8	3.4	1.5	13.8	3	2	9	13
12	3.4	1.5	16.5	3	2	9	18.6
18	5.5	2	24	4.8	3	13.3	24
25	5.5	2	29.5	6	3	13	32.5
40	6.6	2	46	8.5	5	17.5	45
63	11	3	69	13.5	6	28	75

For size	SA				Weight [g]	Part No.	Type
	For DGE-ZR/DGE-ZR-KF		For DGE-ZR-RF				
	GK	GV	GK	GV			
8	198	-	-	-	17	158470	HP-8
12	234	-	-	-	23	158471	HP-12
18	308.6	388.6	-	-	70	158472	HP-18
25	398	498	440	535	61	150731	HP-25
40	604	774	673	813	188	150733	HP-40
63	938	1188	1 076	1 306	305	150735	HP-63



# Toothed belt axes DGE

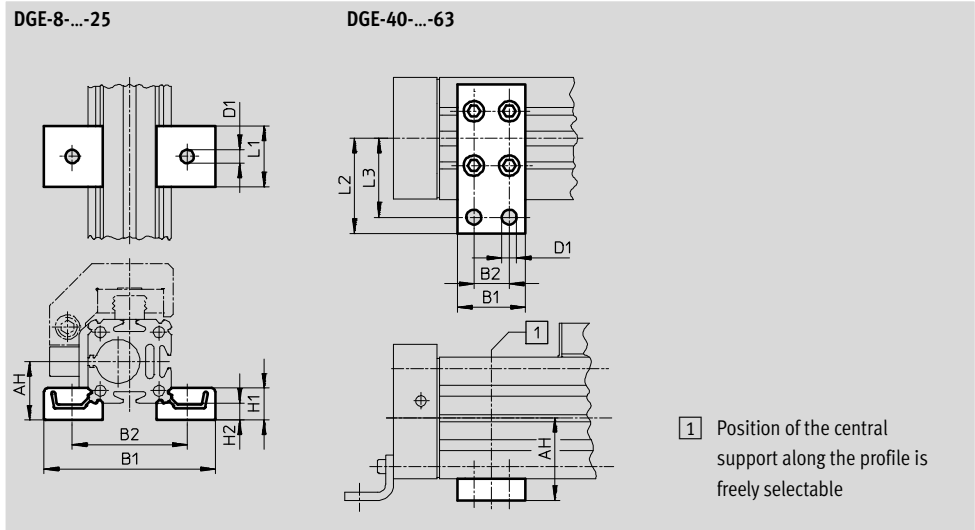
Accessories

**Central support MUP**  
(order code M)

Material:  
Anodised aluminium  
Free of copper and PTFE



MUP-40



1 Position of the central support along the profile is freely selectable

**Dimensions and ordering data**

For size	AH	B1	B2	D1 Ø	H1	H2	L1	L2	L3	Weight [g]	Part No.	Type
8	13.8	40.5	28.5	3.5	8	4	15	-	-	8	160909	MUP-8/12
12	16.5	46	34	3.5	8	4	15	-	-	8	160909	MUP-8/12
18	24	70.5	47	5.5	13	7	25	-	-	33	150736	MUP-18/25
25	29.5	81	58	5.5	13	7	25	-	-	33	150736	MUP-18/25
40	46	35	22	6.6	-	-	-	47	40	126	150738	MUP-40
63	69	50	26	11	-	-	-	77	65	340	150800	MUP-63

# Toothed belt axes DGE


Accessories



## Shock absorber YSR-...-C (order code C)

Materials:  
Housing: Galvanised steel; piston rod:  
High-alloy steel  
Seals: NBR, PUR  
Free of copper and PTFE

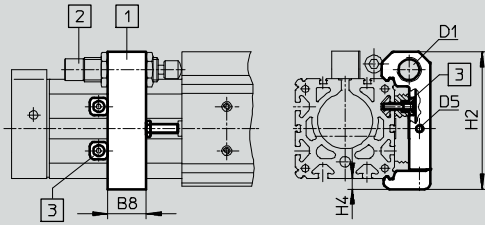


 Note  
Shock absorber YSRW with progressive characteristics  
→ Internet: ysrw

Ordering data		Part No.	Type
For size	Weight [g]		
8	9	158981	YSR-5-5-C
12	9	158981	YSR-5-5-C
18	30	34571	YSR-8-8-C
25	70	34572	YSR-12-12-C
40	140	34573	YSR-16-20-C
63	240	34574	YSR-20-25-C

## Shock absorber retainer KYP (order code C)

Materials:  
Retainer: Aluminium  
Sleeve: Corrosion-resistant steel

**1** Shock absorber retainer KYP (if the retainer is in contact with the bearing cap, i.e. cap serves to secure position, the entire stroke length can be utilised)  
**2** Shock absorber YSR-...-C  
**3** Position retainer (included in the scope of delivery) either behind or underneath the shock absorber retainer KYP

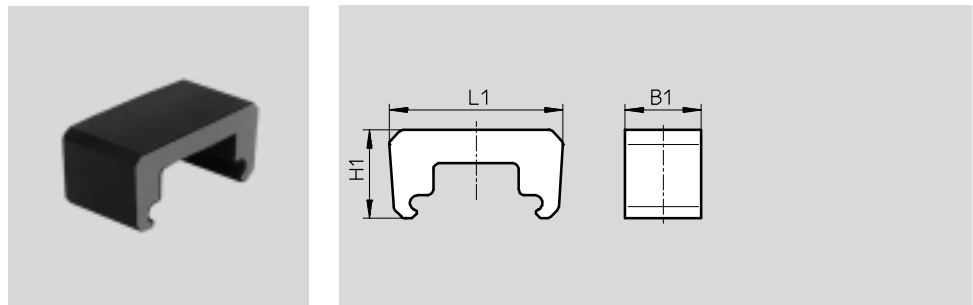
Dimensions and ordering data								
For size	B8	D1	D5	H2	H4	Weight [g]	Part No.	Type
8	8	M8x1	M3	31.5	3	36	158905	KYP-8
12	11	M8x1	M4	37	3	44	158906	KYP-12
18	14	M12x1	M4	50.5	4.5	66	158907	KYP-18
25	19	M16x1	M5	69.5	6	95	158908	KYP-25
40	32	M22x1.5	M5	102	8	209	158910	KYP-40
63	44	M26x1.5	M10	152.5	11.5	609	158912	KYP-63

# Toothed belt axes DGE


Accessories

## Emergency buffer NPE (order code A)

Material:  
PUR



Dimensions and ordering data						
For size	B1	L1	H1	Weight [g]	Part No.	Type
18	15	43.1	28.5	6	193901	NPE-18
25	25	57	29	12	193902	NPE-25
40	40	80.5	36	41	193904	NPE-40
63	60	128.6	55	152	193906	NPE-63

 Note  
The emergency buffer can only be used in combination with shock absorber retainer KYP. →66 (A threaded stud and nut are not required.)

## Shock absorber DG-GA for protected version GA (order code E)

Materials:  
Housing: Galvanised steel; piston rod:  
High-alloy steel  
Seals: NBR, PUR  
Free of copper and PTFE



Ordering data			
For size	Weight [g]	Part No.	Type
25	70	192875	DG-GA-25-YSR
40	140	192877	DG-GA-40-YSR

# Toothed belt axes DGE

Accessories



## Sensor bracket HWS

for inductive proximity sensors  
(order code T)

Material:  
Galvanised steel



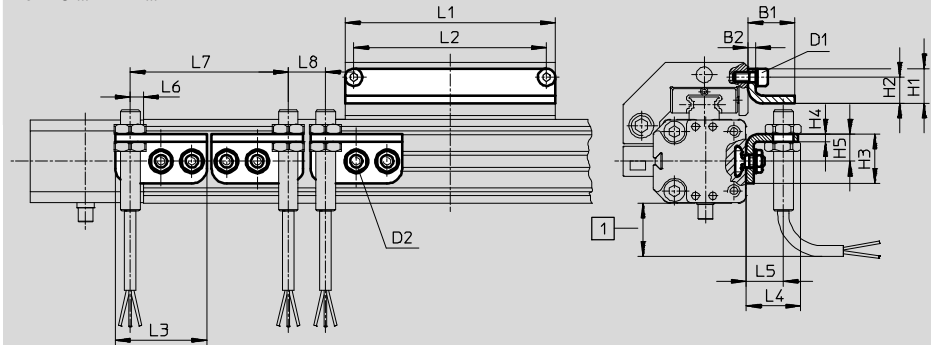
## Switch lug SF

(order code L)

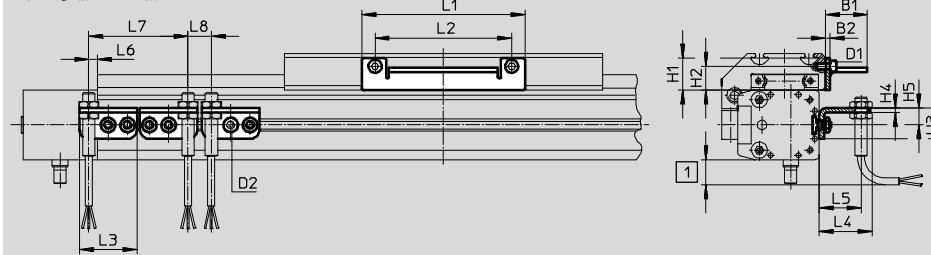
Material:  
Galvanised steel



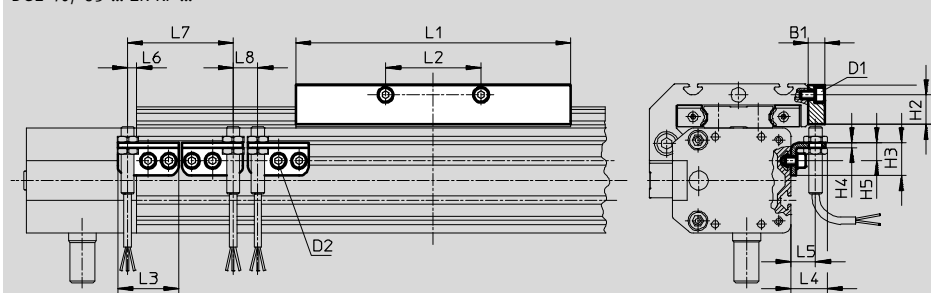
DGE-18-...-ZR-KF-...




DGE-25-...-ZR-KF-...



DGE-40/-63-...-ZR-KF-...



1 Protruding sensor cable, ensure sufficient installation space

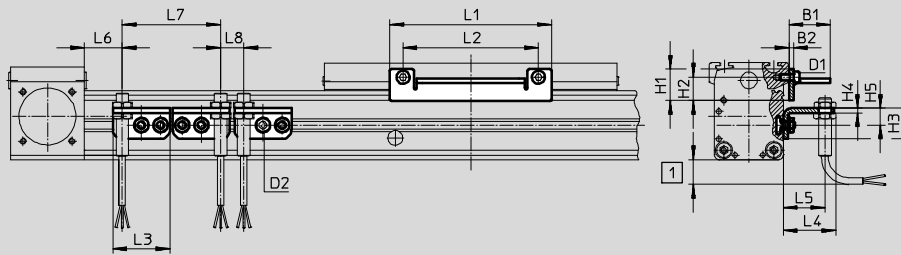
-  - Note

Cannot be used in combination with the variant DGE-...-GA (protected version).

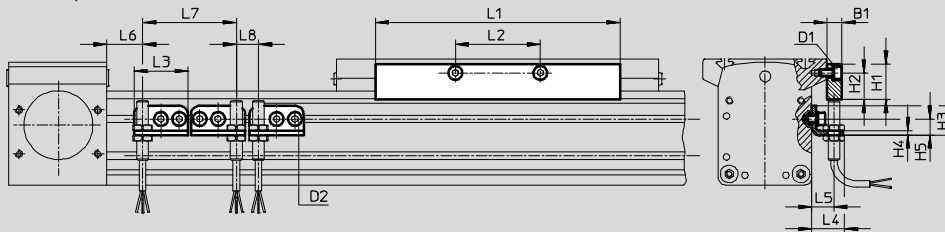
# Toothed belt axes DGE

Accessories

DGE-25-...-ZR-RF...



DGE-40/-63-...-ZR-RF...



1 Protruding sensor cable, ensure sufficient installation space

## Dimensions and ordering data


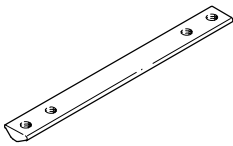

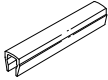
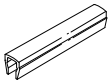
For size	D1	D2	B1	B2	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5
18	M4	M5	19	3	14	10.5	20	3	11	85	78	37	22.5	15
25	M5	M5	27	3	20.5	15.3	20	3	11	105	88	37	34.5	27
40	M5	M5	10	-	24	18	20	3	11	167	58	37	22.5	15
63	M8	M5	10	-	35	25	20	3	11	230	72	37	22.5	15

For size	L6			L7 min.	L8 min.	Weight [g]	Part No.	Type
	DGE-ZR-KF max.	DGE-ZR-RF GK	GV					
18	5.5	-	-	64	15	30	188968	HWS-18/25-M8
						60	188964	SF-18
25	5.5	43.5	91	64	15	30	540780	HWS-25-MAB-M8
						80	540430	SF-25-MAB
40	5.5	68.5	138.5	64	15	40	188969	HWS-40-M8
						310	188966	SF-40
63	5.5	117	232	64	15	40	188970	HWS-63-M8
						630	188967	SF-63

# Toothed belt axes DGE

Accessories

**FESTO**



Ordering data				Technical data → Internet: mounting attachment		
	For size	Comment	Order code	Part No.	Type	PU <sup>1)</sup>
<b>Slot nut NST</b>						
	18, 25	For mounting slot/profile slot	Y	<b>526091</b>	<b>NST-HMV-M4</b>	10
	40			<b>150914</b>	<b>NST-5-M5</b>	1
	63			<b>150915</b>	<b>NST-8-M6</b>	1
<b>Slot nut NSTL</b>						
	25	For slide	X	<b>158410</b>	<b>NSTL-25</b>	1
	40			<b>158412</b>	<b>NSTL-40</b>	1
	63			<b>158414</b>	<b>NSTL-63</b>	1
<b>Centring pin/sleeve ZBS/ZBH</b>						
	8 ... 18	For slide	Z	<b>150928</b>	<b>ZBS-5</b>	10
	25 ... 63			<b>150927</b>	<b>ZBH-9</b>	10
<b>Slot cover ABP</b>						
	40	For mounting slot every 0.5 m	B	<b>151681</b>	<b>ABP-5</b>	2
	63			<b>151682</b>	<b>ABP-8</b>	
<b>Slot cover ABP-S</b>						
	8 ... 63	For sensor slot every 0.5 m	S	<b>151680</b>	<b>ABP-5-S</b>	2
	25	For mounting slot for DGE-ZR-RF	B			



1) Packaging unit



# Toothed belt axes DGE



Accessories

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Ordering data – Proximity sensors for T-slot, magnetic reed						Technical data → Internet: sme	
	Type of mounting	Switching output	Electrical connection	Cable length [m]	Part No.	Type	
N/O contact							
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	150855	SME-8-K-LED-24	
			Plug M8x1, 3-pin	0.3	150857	SME-8-S-LED-24	
N/C contact							
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	7.5	160251	SME-8-O-K-LED-24	

Ordering data – Proximity sensors for T-slot, magneto-resistive						Technical data → Internet: smt	
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type	
N/O contact							
	Insertable in the slot from above, flush with cylinder profile, short design	PNP	Cable, 3-wire	2.5	574335	SMT-8M-A-PS-24V-E-2,5-OE	
			Plug M8x1, 3-pin	0.3	574334	SMT-8M-A-PS-24V-E-0,3-M8D	
N/C contact							
	Insertable in the slot from above, flush with cylinder profile, short design	PNP	Cable, 3-wire	7.5	574340	SMT-8M-A-PO-24V-E-7,5-OE	

Ordering data – Inductive proximity sensors M8						Technical data → Internet: sien	
	Electrical connection		Switching output	LED	Cable length [m]	Part No.	Type
	Cable	Plug M8					
N/O contact							
	3-wire	–	PNP	■	2.5	150386	SIEN-M8B-PS-K-L
	–	3-pin	PNP	■	–	150387	SIEN-M8B-PS-S-L
N/C contact							
	3-wire	–	PNP	■	2.5	150390	SIEN-M8B-PO-K-L
	–	3-pin	PNP	■	–	150391	SIEN-M8B-PO-S-L

Ordering data – Connecting cables					Technical data → Internet: nebu	
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Type	
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541333	NEBU-M8G3-K-2.5-LE3	
			5	541334	NEBU-M8G3-K-5-LE3	
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541338	NEBU-M8W3-K-2.5-LE3	
			5	541341	NEBU-M8W3-K-5-LE3	


# Toothed belt axes DGE

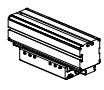
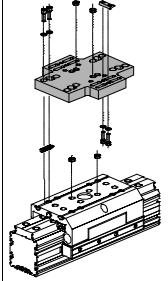
Accessories



**Adapter kit  
HMVK**

Material:  
Wrought aluminium alloy  
Free of copper and PTFE  
RoHS-compliant

 Note  
The kit includes the individual mounting interface as well as the necessary mounting material.

Permissible drive/drive combinations with adapter kit			Download CAD data → <a href="http://www.festo.com">www.festo.com</a>		
Combination	[1] Drive	[2] Drive	Adapter kit		
	Size	Size	CRC <sup>1)</sup>	Part No.	Type
DGPL, DGE, DGEA/DGE	DG...	DGE	HMVK		
 1   2	Direct slide/slide mounting				
	18, 25	25	2	196779	HMVK-DL25-DL18/25
	25	32		196781	HMVK-DL32/40-DLA18-32
	18 <sup>2)</sup> , 25, 32 <sup>3)</sup>	40		196781	HMVK-DL32/40-DLA18-32
	25 <sup>2)</sup> , 40	63		196783	HMVK-DL63-DLA25/40
	Direct slide/profile mounting				
	18	18	2	196780	HMVK-DL18/25-DL18/25
	25	25		196780	HMVK-DL18/25-DL18/25
	25	32, 40		196782	HMVK-DL32/40-DL25
	32 <sup>3)</sup> , 40	40		196781	HMVK-DL32/40-DLA18-32

- 1) Corrosion resistance class CRC 2 to Festo standard FN 940070  
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.
- 2) Only for DGEA-...
- 3) Only for DGPL